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DISEASES CAUSED BY BACTERIA AND FUNGI.

I. HANSEN, P., & ARNE. (1935). **Mastitis. III. The Identity of** *Streptococcus agalactiae.—Tech. Bull. N.Y. Sta. agric. Exp. Sta.* No. 232. pp. 52. 2 plates, 6 tables. [Numerous refs.]

II. DAHLBERG, A. C., KUCERA, J. J., HENING, J. C., & HUCKER, G. J. (1936). **Mastitis. IV. The Composition of Milk as Affected by Latent Mastitis.**—*Ibid.* No. 239. pp. 16. 6 tables. [15 refs.]

III. HUCKER, G. J. (1937). **Mastitis. V. The Presence of Mastitis Streptococci in Bovine Mammary Tissue.**—*Ibid.* No. 241. pp. 21. 3 tables. [8 refs.]

IV. HUCKER, C. J., & REED, M. S. (1937). **Mastitis. VI. The Effect of Feeding Irradiated Yeast on the Resistance of the Udder to Bovine Mastitis.**—*Ibid.* No. 243. pp. 10. 4 tables. [2 refs.]

V. HUCKER, G. J., REED, Marion, & SAVAGE, E. S. (1937). **Mastitis. VII. The Relation of Bovine Mastitis to Milk Production.**—*Ibid.* No. 244. pp. 97. 9 figs., 19 tables. [Numerous refs.]

VI. HUCKER, G. J., & HANSEN, P. A. (1937). **Mastitis. VIII. The Use of a Specially Prepared Vaccine in an Attempt to Control Bovine Mastitis.**—*Ibid.* No. 245. pp. 12. 5 tables. [8 refs.]

VII. HUCKER, G. J., & HARRISON, E. S. (1937). **Mastitis. IX. The Maintenance of a Herd Free From Mastitis.**—*Ibid.* No. 246. pp. 25. 3 figs., 9 tables. [11 refs.] [See also *V.B.* **4.** 5 and 57].

I. H. and A. have made a study of 94 cultures of mastitis streptococci obtained from other laboratories which have dealt with the subject, and of 149 strains which they have isolated themselves. The latter were from two herds and a large number (104) were obtained from the same cow. The latter results have served to show the stability of the mastitis streptococcus in a given cow. They have found that the majority of the streptococci they have isolated and those from other laboratories, conform to one general type. They support the view that the name *Streptococcus agalactiae*, as the oldest binomial in use, should be used

for this species. They conclude that its important characters are :– acid-production from fructose, glucose, mannose, galactose, maltose, sucrose and dextrin, while acid is not formed from mannitol, sorbitol, arabinose, xylose, raffinose, inulin, or amygdalin. Trehalose was fermented by 89 % of the cultures. Starch is frequently fermented in freshly isolated cultures, but the ability is often lost later. Salicin fermentation (87 %) seems to be constant for single strains for long periods of observation, but does not correlate with any other character. Gelatin is not liquefied and nitrate is not reduced. Litmus milk is not reduced before curdling. Sodium hippurate is hydrolyzed, but aesculin is never split. They believe that the three latter characters can be used with advantage for the rapid identification of *Str. agalactiae.* No acid is formed at 10°C. and none at 45°C. Various types of haemolysis were observed on blood agar, but with one exception, broad zone beta haemolysis was never found. Pigmentation was observed in a small number of strains.

A few strains of streptococci belonging to other groups or species, which may cause mastitis, were also examined.

II. The work reported was undertaken to determine whether, in milk which is normal in appearance, there is any demonstrable relationship between latent infection with mastitis streptococci and the degree of this infection and the chemical composition of the milk. The conclusions of earlier workers, that abnormal mastitis milk shows a marked difference in composition from that of normal milk were confirmed.

Only cows whose udders were free from active inflammation and whose milk was normal in appearance were selected for this study ; they were divided into three groups :– those showing no infection, those showing slight infection, and those showing pronounced latent infection. Composite milk samples of complete milkings from groups of animals falling into each of these categories were submitted to detailed chemical analysis. Animals were classified into groups by the examination of quarter samples of fore milk to determine the number of leucocytes, the pH, and the presence or absence of mastitis streptococci, by incubating the samples overnight at 37°C. and examining microscopically.

The presence of latent infection with mastitis streptococci was associated with a decrease in lactose, specific gravity, skimmed milk solids and curd tension, and an increase in chlorides and albumins. So long as the milk remained normal in appearance, however, these changes, though definite, were slight in degree and, according to the authors, not greater than variations which might occur between the milk of two herds of the same breed.

It is concluded that, provided secretion from inflamed, congested or injured quarters is excluded and the milk is normal in appearance, the presence of latent mastitis will have no important effect upon the composition of the herd milk as a whole.

III. The purpose of the investigation was to determine the incidence of infection with mastitis streptococci in the udders of animals in which no obvious evidence of infection could be found *ante* or *post mortem.* The udders were removed from 46 such animals and cultures made by cutting the tissue into small pieces, incubating in large volumes of broth, plating and, finally, selecting streptococcus-like colonies for further examination. H. concludes that mastitis streptococci were obtained from all of 24 udders of cows which had passed through one or more lactations and from " less than half " of 21 udders of virgin heifers or calves.

[The question studied is one of some importance, and its investigation, apart from the preliminary work required, involved the identification of a considerable number of strains. It is unfortunate, therefore, that the author, in forming his

conclusions, appears to have ignored many of the accepted characters of the mastitis streptococci and, in particular, those of *Str. dysgalactiae* and of *Str. uberis*. (These two organisms are, according to DIERNHOFER, who introduced the names, identical with mastitis streptococcus Groups II and III respectively, of the British workers MINETT, F. C., STABLEFORTH, A. W., and EDWARDS, S. J.). Incidentally the tables show 21 cows and 24 heifers and calves.

With regard to the heifers and calves (table II), 12 strains which fermented inulin and raffinose are called *Str. dysgalactiae* (strains from 5612, 5610, 5606, 94682, 5609 and 5608). Further, 3 strains which fermented the same 2 sugars are called *Str. agalactiae* (from 5610 and 5606), whilst 1 strain which was weak β and did not ferment inulin (from 349564) is called *Str. uberis*. All of these are surely misnomers. Without referring in detail to certain other questionable cases it may be said that only two (instead of 11) of the heifers and calves gave organisms which had the generally accepted characters of mastitis streptococci.

Similarly, with regard to the cows (table I): 2 strains, which fermented raffinose (from 5607 and 66513), 7 strains which fermented raffinose and inulin, one of which was also weak β (from 5612 and 5656), and many which were weak β, are called *Str. dysgalactiae*; whilst five strains which did not ferment inulin (from H 94630, 90436, 90437 and 84762) and two which fermented raffinose (Pass No. 1032 and 368358) are called *Str. uberis* – again surely misnomers. The evidence in many other cases appears questionable and, to summarize, it would seem that the protocols show no evidence of the presence of mastitis streptococci in 10 cows, questionable evidence in 6 and fairly good evidence in 5 cows instead of all, as concluded by HUCKER].

IV. Fifty-one out of 116 cows in four dairy herds were fed irradiated yeast at the rate of 9 oz. per cow per day, or (in one herd) $4\frac{1}{2}$ oz. per cow per day. Weekly examinations of quarter samples of milk for mastitis streptococci, number of leucocytes per c.c., pH and obvious changes were made for 4 months before the feeding commenced and for 20 months after the feeding commenced. The feeding of irradiated yeast was found to have no significant effect upon the resistance of the udder to invasion by mastitis streptococci as determined by the number of new infections. Amongst infected cows rather more of the yeast-fed cows than of those which did not receive yeast showed an improvement.

No prophylactic effect followed the addition of irradiated yeast to the diet of mastitis-free cows.

V. An investigation concerning the influence of mastitis upon milk and butter fat production. During a period of four years 35 cows were studied, of which 15 were healthy and three were infected throughout, while 17 became infected during the investigation. Milk and fat production records were taken daily, and once-weekly quarter samples were examined for the macroscopic appearance of the milk, its reaction to bromthymol blue, the presence of mastitis streptococci, and the number of leucocytes per c.c.

The general conclusion is that streptococcus mastitis must be sufficiently advanced to make the milk alkaline to bromthymol blue or to cause changes in its physical appearance before the yield of milk, as indicated by the " lactation period production trends or persistency ", is materially reduced. The total milk yield and butter fat production were found to run parallel. In amplification, it is stated that the presence of mastitis streptococci or of a leucocyte count higher than 500,000 per c.c. did not affect production. The same was true when latent chronic mastitis was confined to one quarter, but when three or more quarters were involved, significant effects were produced. Advanced infections of a single quarter diminished production when the condition became active and the milk was

abnormal in appearance. [The conclusions are subject to the criticism that the authors did not use statistical methods or make any corrections for age, length of dry period and of service period, etc. It is not stated whether the cows were free from *Br. abortus* infection. No reference is made to the work of SANDERS, who showed the factors that must be taken into account in studying milk yields, nor to the work of MINETT and MARTIN [*V. B.* **6.** 905.], who made use of SANDERS' data in studying the effect of mastitis and brucella infection on milk yields].

VI. A study was made of the possible prophylactic and therapeutic action of a formolized vaccine prepared from stock and freshly isolated herd strains of *Str. agalactiae*. Large doses were given intramuscularly on 6 occasions over a period of about 5 months. Injections of milk were used in connexion with the vaccines.

102 animals in four herds were studied over a period of two years, 45 being vaccinated and 57 being retained as untreated controls.

Weekly quarter samples were secured for 4 to 7 weeks prior to vaccination, and weekly quarter samples for 3 months and monthly quarter samples for approximately 14 months subsequent to vaccination. They were examined for the presence of mastitis streptococci, number of leucocytes per c.c., reaction to bromthymolblue, and the physical appearance of the milk.

It is concluded that vaccines prepared from stock and freshly isolated strains of *Str.a.* give no evidence of increasing the resistance of dairy cattle to mastitis.

Similar vaccines were found to have little or no therapeutic action in the treatment of latent and chronic udder infections. Neither the prophylactic nor therapeutic action of this vaccine was stimulated by the use of simultaneous intramuscular injections of milk.

VII. A study, covering a period of two to three years, of three experimental herds containing 271 cows at Cornell University. [271 was the total number of cows which passed through the herds during the period of study]. Fore milk samples from each quarter were examined weekly for mastitis streptococci, leucocyte count, bromthymol blue reaction, and physical appearance of the milk. Judged by these criteria, at the beginning one herd was built up of cows which were not then discharging mastitis streptococci, the second herd contained a proportion of infected cows and the third a still larger proportion. The second herd was divided into two groups, in one of which the infected cows were milked last, while in the other " no effort was made to classify the individuals from the standpoint of infection ". In the third herd some attempt was made " to milk the cows in the order of their infection ". Under the conditions of working, none of the herds could be maintained free from infection. [But in this connexion it must be noted that any infected cows from the first herd were transferred to one of the other two. Moreover, the herds were being used at the same time for experiments connected with animal husbandry]. It was possible, however, to maintain a herd relatively free from cows producing abnormal milk. The percentage of new infections appearing in the herd decreased in proportion as the amount of original infection decreased. Of 68 first-calving heifers, 36% discharged mastitis streptococci during the first week of lactation, and the incidence among heifers was higher in the more heavily infected herds.

[It must be emphasized that the term " mastitis streptococci ", as used by the authors, includes groups 1, 2, 3 of MINETT, STABLEFORTH and EDWARDS, group 1 being identical with *Str. agalactiae*. No one has suggested that it is possible to control infection by streptococci of all these groups, but it has proved possible to build up a herd which remains free from *Streptococcus agalactiae*. The authors do not say how many of their cases were due to *Streptococcus agalactiae*.]—F. C. MINETT, & A. W. STABLEFORTH.

VELU, H., WEYLAND, H., & SARTHOU, C. (1937). La gourme et les transports à longue distance de jeunes chevaux. [**Strangles and the Long Distance Transport of Young Horses**].—*Rev. vét. milit.* **21.** 171-182. 3 tables. [2 refs.]

The indigenous horses of Morocco are resistant to strangles and when the disease does affect them it is of a benign nature. Of 278 imported remounts, however, 249 contracted the disease in a severe form. The majority were 3-4 years old, exposed to infection when their resistance had been lowered by a sudden change of stable management and a sea voyage at a time of year when the atmospheric temperature fluctuated greatly. Nine severe cases complicated by pulmonary lesions, and two affected with paraplegia, were successfully treated with a single injection of 1 g. of " gonacrine ". It is recommended that if young susceptible horses must be sent to Morocco they should be imported between April and June and that changes in diet and general management should be introduced gradually.

—G. WILLIAMSON.

I. FILDES, P., & RICHARDSON, G. M. (1937). **The Nutrition of *Staphylococcus aureus*: Sulphur Requirements.**—*Brit. J. exp. Path.* **18.** 292-304. 1 table. [Numerous refs.]

II. GLADSTONE, G. P. (1937). **The Nutrition of *Staphylococcus aureus*: Nitrogen Requirements.**—*Ibid.* 322-333. 5 tables. [12 refs.]

III. MCBROOM, Josephine. (1937). **Relation of Hemotoxin Production to Metabolic Activities of Staphylococci.**—*J. infect. Dis.* **60.** 364-369. 2 tables. [7 refs.]

IV. SMITH, Margaret L. (1937). **Circulating Antitoxin and Resistance to Experimental Infection with Staphylococci.**—*J. Path. Bact.* **45.** 305-310. 3 tables. [18 refs.]

I. This communication deals with a detailed study of the effects of various organic sulphur compounds on the growth of *Staphylococcus aureus*. It was found that a compound containing, actually or potentially, a mercapto-group was necessary. Cystine was found to be especially active; methionine, although unsatisfactory as a potential source of sulphur, has an accelerating influence on growth produced in media containing cystine.

II. This deals with work carried out in association with the above authors. By a process of training, strains of *Staph. aureus* were produced which could grow on a medium from which all amino-acids were excluded and whose main source of nitrogen was ammonia.

III. The following observations were made on the metabolic activities of a large number of strains of staphylococci :- (1) oxidation-reduction, reduction of methylene blue to its leuco-base; (2) proteolytic activity, hydrolysis of peptone with determination by formol titration of amino-acids liberated; (3) lipolytic activity, hydrolysis of tributyrin with determination of amount of acid formed, and (4) carbohydrate metabolism, fermentation of glucose with measurement of acid formed. At the same time, the strains were tested for the production of haemotoxin. It was found that haemotoxin production was correlated with extent and speed of reduction of methylene blue, but that there was no relation with the other activities tested.

IV. Five groups of 4 rabbits were immunized against staphylococcus " strain Wood 46 " with respectively (1) washed living suspension, (2) washed formolized vaccine, (3) alum toxoid, (4) floccules and later, toxoid, and (5) toxoid. The content of α antitoxin in each rabbit was estimated eight days after the third immunizing injection and then the animals were injected intraven. with about eight lethal doses

of washed living staphylococci. It was found that the rabbits immunized with antigens prepared from culture filtrates, *viz* preparations (3), (4) and (5) had produced very much larger amounts of α antitoxin than those immunized with washed suspensions. Further, there was a marked correlation between the α antitoxin titre and resistance to living staphylococci, but S. emphasizes that this correlation does not prove that immunity is due to the antitoxin. Four surviving rabbits developed paralysis at varying intervals after the test inoculation and on P.M. examination were found to have staphylococcal abscesses in the vertebrae, thus showing that antitoxin in the circulating blood did not prevent the development of localized staphylococcal lesions.—C. A. McGaughey.

I. Tomcsik, J., & Szongott, H. (1933). Ueber ein spezifisches Protein der Kapsel des Milzbrandbazillus. [**A Specific Protein of the Capsule of the Anthrax Bacillus**].—*Z. ImmunForsch.* **78.** 86-99. 4 tables. [1 ref.]

II. Tomcsik, J., & Bodon, G. (1934). **Agglutination of the Encapsulated Anthrax Bacilli.**—*Proc. Soc. exp. Biol., N.Y.* **32.** 118-121. [3 refs.]

III. Bodon, G., & Tomcsik, J. (1934). **Effect of Specific Antibody on the Capsule of Anthrax Bacilli.**—*Ibid.* 122-125. 3 figs. [7 refs.]

IV. Tomcsik, J., & Bodon, G. (1935). Passive Schutzimpfung von Mäusen mit antikapsulärem Milzbrandimmunserum. [**Passive Immunization of Mice with Anti-Capsular Immune Serum**].—*Wiss. Woche, Frankfurt, 1934.* pp. 114-117. 1 table. [3 refs.]

I. In addition to polysaccharides, capsular material from virulent anthrax bacilli contains a protein fraction, which is only found in capsulated strains. In serological tests such as Ascoli's precipitin test, attention should be paid to this protein fraction. Most samples of anti-anthrax serum used in such tests only contain antibody to the polysaccharide fraction, but if the antiserum contains antibody against the protein factor a far more sensitive serological test may be carried out.

II. True agglutination of *Bacillus anthracis* can be demonstrated if a strain is found which gives a stable suspension. This true agglutination only occurs with encapsulated strains and has been shown to be due to the reaction between the protein fraction of the capsule and its corresponding antibody.

III. Specific immune serum which contains the special anti-protein factor if mixed with a suspension of capsulated bacilli, acts upon the capsules rendering them visible in unstained preparations.

IV. The authors report attempts to immunize mice with various kinds of antiserum against inoculation with measured doses of anthrax culture. Antiserum prepared by injecting horses with killed cultures of anthrax bacilli and also a commercial product called " anti-agressin ", failed to protect mice when administered shortly before a test dose of virulent bacilli. Antiserum specially prepared against the carbohydrate fraction of the capsule gave partial protection, whilst that prepared against the protein fraction of the capsule gave absolute protection. [These experiments were carried out on very small groups of animals].—E. J. P.

López, C., Lajo, T. V., Lopez, F., & Canas, T. (1937). Vaccinations avec le vaccin anticharbonneux glucosidé. [**Glucoside Vaccines against Anthrax**]. —*Bull. Off. internat. Epiz.* **14.** 352-355.

This is a brief résumé of the authors' work on anti-anthrax vaccination. Live vaccines prepared with saponin, digitonin, or a mixture of these glucosides, were used on 1,000,000 animals of different species with apparently satisfactory results. One inoculation was sufficient to confer a solid and lasting immunity.—N. J. S.

BINDEL, L. (1937). Badania uproszczeniem czynnego uodparniania przeciw waglikowi. [**Intradermal Vaccination against Anthrax**].—*Przegl. wet.* **52.** 133-148 and 210-219. 7 tables. [Numerous refs.] [French summary].

As the result of numerous experiments B. concludes that animals in vigorous health can be immunized by a single injection of Pasteur's No. 2 vaccine without a preliminary injection of the No. 1 vaccine. Immunity lasts for at least six months.

Animals in poor health, ought, however, to receive the two vaccines in the usual way. The recommended dose of No. 1 vaccine is, for oxen, 1·5 c.c., for cows 0·8-1 c.c., for horses 0·7-0·8 c.c. and for sheep 0·4-0·6 c.c.—A. S. (Lwów).

PALLASKE, G. (1937). Die Bedeutung der vergleichenden Pathologie für das Tuberkuloseproblem. [**Significance of Comparative Pathology in Tuberculosis**].—*Z. InfektKr. Haustiere.* **50.** 229-236.

A concise review of the pathogenesis of TB. summarizing the work begun by NIEBERLE and extended by other workers during the last few years.

Of primary importance for the determination of the portal of entry of the tubercle bacillus is the recognition of the " primary complex ". Its form is very varied – there may be absence of " tubercles ", of caseation or of calcification, and histological examination may be needed for its identification.

The peculiar productive reaction in TB. in the horse, in avian infection in pigs and especially in TB. as seen in carnivora and fur-bearing animals, has resulted in many such cases being overlooked, even after histological examination. In contrast, the predominantly exudative type of reaction is best seen in the diffuse caseating TB. of cattle leading to blood-stream invasion.—E. G. WHITE.

VIERHAUS, J. (1936). Beitrag zur Feststellung der Eutertuberkulose des Rindes bei der Fleischbeschau. [**Demonstration of Udder Tuberculosis in the Course of Meat Inspection**].—*Inaug. Diss., Hanover.* pp. 39. 2 tables. [Numerous refs.]

It frequently happens that although TB. lesions are present in the udder they are not visible to the naked eye. V. emphasizes the importance of microscopic examination to demonstrate the tissue changes, or the bacilli.—G. H. (VIENNA).

CARPANO, M. (1937). **Tuberculosis of Buffaloes in Egypt with Some Tuberculosis Test Experiments.**—*Rep. vet. Serv. Egypt, 1932-1933.* pp. 100-117. 3 tables.

A brief general account is given of buffaloes as they occur in Egypt, indicating the reasons for their popularity, their chief characteristics and their geographical distribution. Owing to their resistance to disease and low cost of maintenance more of these animals are kept than cattle. The percentage of casein and fat in the milk is nearly double that of cows' milk.

In lower Egypt where cattle and buffaloes are housed, TB. is wide-spread. The observations as to incidence are limited to those obtained from public abattoirs.

At the Alexandria abattoir about 60% of aged animals were infected. In the Cairo abattoir the incidence was considerably less, and this is considered to be due to the fact that most of the animals slaughtered there were from Upper Egypt or the Sudan. About 7% of all buffaloes and 10% of all cattle were found to be affected. The percentage in the provinces was much higher owing to lack of control.

Preliminary tuberculin tests were carried out on a herd of 348 buffalo cows and 2 bull buffaloes. A German and a locally prepared tuberculin were used, the site for the intraderm. inoc. being the caudal fold. The temperature reaction could not be correlated to the local reaction. 51 buffaloes developed local reactions

and in these animals there was a transitory diminution in the bulk of milk produced. 44 of these animals were subsequently tested by the subcutaneous method. Only 11 of them gave definite positive reactions and these 11 positives were confirmed on P.M. examination. Apparently, in many instances, a local reaction to the subcutaneous test developed in some cases of such severity as to cause lameness and inappetence.

The results obtained with the two types of inoculation are compared. The skin of the buffalo is apparently hypersensitive to some ingredient in the tuberculin used. Apparently two cases which were positive to the subcutaneous reaction were negative to intradermal and subpalpebral tests. [There is an error in the text here and the meaning is not clear]. The second tests were, however, carried out eight months after the first tests and this fact might have confused the results. It is considered that the clinical diagnosis is more difficult in buffaloes than cattle, but little evidence is produced in support of this statement. It is also considered that the subcutaneous test is more accurate when applied to buffaloes than the intradermal.—F. H. Manley.

Pühmeyer, H. (1936). Inwieweit ist bei der Tuberkulinprüfung der Rinderbestände eine Infektion mit Geflügeltuberkulose zu berücksichtigen? [**Significance of Avian Type Tuberculosis as Factor in Tuberculin Tests on Cattle**].—*Inaug. Diss., Hanover.* pp. 30. [Numerous refs.]

Intradermal tests on 2,268 cattle in 283 herds were carried out with bovine and avian tuberculins; 642 (28%) reacted to the former and 123 (5·42%) to the latter. These herds were free from Johne's disease. About 75% of the animals reacting to bovine tuberculin showed a simultaneous doubtful reaction to avian tuberculin and 50% *vice versa*. As indicated by the tuberculin tests 23% of the herds were free from both bovine and avian TB., 51% were infected with bovine TB. only, and 18% with a mixed infection. In 8·5% reactions to avian tuberculin predominated, though there were simultaneous doubtful reactions to bovine tuberculin. In the last group there was every opportunity for the cattle to contract infection from tuberculous poultry. In the cattle affected with avian TB. no obvious symptoms were seen and tubercle bacilli could not be demonstrated in the bronchial mucus, milk or uterine discharge.—S. J. Edwards.

Tulloch, W. J. (1936). **Avian Type Tubercle Bacillus: Its Characteristics, Cultural and Pathogenic, with a Demonstration of Natural Disease produced by the Bacillus.**—*Edinb. med. J.* **43.** 144-159. 2 tables.

The subject matter of this article is the infection of man with avian type tubercle bacilli. T. reviews the pathogenicity of this organism for mammals and birds and gives an account of the incidence of such infection with the avian type of bacillus in the farm animals. This portion of the article contains no new material. The remainder is a justification of the need for care in diagnosing TB. due to the avian type of bacillus in man. T. lays down seven criteria which he considers essential to the confirmation of such a diagnosis :– (1) wide range of temperature over which growth occurs; (2) occurrence of growth at avian temperature; (3) rapidity of growth and its softness; (4) adsorption of agglutinins test; (5) pathogenicity for the rabbit under clearly defined conditions; (6) pathogenicity for fowls, and (7) absence of invasive capacity in respect of g. pigs.—C. Davenport.

Piwowarczyk, S. (1937). Rozróżnianie typów gruźlicy na podstawie pożwek. [**Cultural Differentiation of Tubercle Bacilli**].—*Wiad. weteryn.* **16.** 222-226. 1 table. [French summary].

S. describes the growth of human, bovine and avian tubercle bacilli on the media of Petragnani, Löwenstein and Besredka respectively.—A. S. (Lwów).

I. Witte, J. (1937). Beeinflussung der Kolonieformen der Tuberkelbakterien des Typus bovinus durch Züchtung bei verminderter Sauerstoffspannung unter Berücksichtigung der Typenunterscheidung. [**Influence on Bovine Tubercle Bacilli of Reduced Oxygen Tension in the Medium. Effect on Type Differentiation**].—*Zlb. Bakt. I.* (*Orig.*). **139.** 279-282. 3 figs.

II. Corper, H. J. (1937). **An Interpretation of the Virulence (or Pathogenicity) of Tubercle Bacilli Based on Experimental Observations : Mycobacterium nusquam phymatiosis.**—*J. infect. Dis.* **60.** 312-318. [18 refs.]

III. Rosenberger, R. C., & Merves, L. (1937). **Studies on the Influence of Sulphur and Certain of its Compounds on the Growth of the Tubercle Bacillus.**—*Ibid.* **61.** 69-72. [7 refs.]

I. Growth of the bovine type of tubercle bacillus was found to be very much improved if cultures were grown in a reduced oxygen tension. Suitable conditions can be obtained if the tubercle bacilli are grown side by side with *Bacillus simplex* [a free-growing, aerobic, sporulating bacillus]. Under such favourable conditions bovine strains produced large cauliflower-like colonies in a comparatively short time. [It is very probable that the important factor is not so much the oxygen as the carbon dioxide tension, *c.f. Brucella abortus*, *Actinomyces bovis*, etc.]

II. Three old laboratory cultures of tubercle bacilli have been submitted to an extensive examination. According to their histories, two of these strains were of human origin and one of bovine, but all three were indistinguishable by cultural and pathogenicity tests. On the basis of these results, C. develops the argument that the present method of classifying the tubercle bacilli is unsatisfactory. He advocates that all virulent strains be called *Mycobact. tuberculosis* and that all strains which have lost their virulence be grouped together under a single name and given generic status. Thus terms such as BCG, avirulent human type, " R1 " type, etc., would be abolished.

III. Flowers of sulphur inhibit the growth of tubercle bacilli, but other acid-fast bacilli and many non-acid-fast organisms are not influenced by this reagent. Calcium thiosulphate has a similar action. The influence of sulphur and sulphur compounds was studied with a view to finding satisfactory therapeutic and disinfective agents for use in the suppression of tuberculosis.—E. J. Pullinger.

Gróh, E. (1937). Ueber die Much-Granula. [**The Much Granules**].—*Zlb. Bakt. I.* (*Orig.*). **139.** 343-353. 1 table.

In 1907, Much described three stages in the development of the tubercle bacillus – an acid-fast rod, a non-acid-fast rod, and a granular form. The two latter were stained by a prolonged Gram stain, the so-called Much staining method. These conclusions were based on a study of human and bovine tuberculous material and the findings have been confirmed by some workers and denied by others.

G. examined cases of tuberculosis in man (206 cases), cattle (32 cases), rabbits (8 cases) and g. pigs (2 cases). Much's non-acid-fast rods are considered to be dying or dead forms of the tubercle bacillus and the granules to represent developing spores. The arrangement of the latter is different in the human and bovine types of tubercle bacilli.

In caseating areas the tubercle bacilli are no longer acid-fast and cannot be stained by any method ; the granules lying within or without the rods can be demonstrated by the use of prolonged staining.

The stages of development described by Much were not found : the tubercle bacillus existed only either in the usual acid-fast form or as spores – the latter ripening and becoming acid-fast bacilli.

Cultural methods and experimental inoculation confirmed the view that most of the non-acid-fast rods and granules were dead.—E. G. White.

Anon. (1936). Emploi de la vaccination dans la prophylaxie de la tuberculose des bovidés. [**Use of BCG Vaccination in Control of Bovine Tuberculosis**]. —[Reprinted in *Rev. vét., Toulouse.* **88.** 540-541].

This is the publication by the Minister of Agriculture, France, of an order stipulating that wherever BCG vaccination is proposed there must be available on the premises an isolation building thoroughly disinfected and in good condition. Before vaccination begins, all cases of ' open ' tuberculosis must be slaughtered. The remaining animals are to be tuberculin tested and reactors must be isolated from non-reactors. The infected premises must be disinfected. Calves must be placed in the isolation building immediately after birth, vaccinated within 15 days, and isolated for 2 months. If given milk, this must be free from infective tubercle bacilli. Vaccinated animals must be marked and revaccinated each year. —C. A. McGaughey.

Carpano, M. (1937). **A Preliminary Note on Severe Infections in Camels Caused by Corynebacteria.**—*Rep. vet. Serv. Egypt, 1932-1933.* pp. 138-140.

The disease is wide-spread in Africa and Asia and appears as a lymphadenitis resembling caseous lymphadenitis in sheep. It rapidly spreads through a unit in which a diseased camel is in close contact with others. Cure is difficult owing to the rapidity with which the infection spreads in the body and causes death.

The causal organism is apparently a typical diphtheroid. The cultural characters of the organism and its pathogenicity for g. pigs, dogs, fowls and pigeons are described. Cross-immunity toxin inoculation experiments on g. pigs, rabbits and dogs to determine the relationship to the organism of human diphtheria show a certain amount of resemblance between the two organisms.

Intravenous injections of " neosalvarsan " and " trypaflavine " appeared to have some curative effect, as did repeated subcutaneous inoculation of formolized cultures.—F. H. Manley.

Stryszak, A. S. (1937). Wpyw niektórych substancyj niespecyficznych na zarazek różycy świń. [**Influence of Non-Specific Substances on** *Erysipelothrix rhusiopathiae*].—*Wiad. weteryn.* **16.** 1-7. **3** tables. [8 refs.] [German summary].

S. tested the pathogenic action of virulent cultures of *E.r.* on pigeons. Cultures were mixed respectively with olive oil, castor oil, liquid paraffin, lanolin, lard, vaseline, kieselguhr, lycopodium, talc, ox bile and pig bile. None of these substances had any effect on the virulence of *E.r.* except kieselguhr.—A. Szwabowicz (Lwów).

Ivánovics, G., & Ivánovics, C. (1937). Beiträge zur Kenntnis des " Bacterium influenzae murium " (Kairies und Schwartzer). [" *Bacterium influenzae murium* "].—*Zlb. Bakt. I.* (*Orig.*). **139.** 184-188. 2 tables. [7 refs.]

The organism which has been described by Kairies [*V. B.* **7.** 317.] as " *Bact. influenzae murium* " was instilled intranasally into mice under ether narcosis, and the mice were subsequently kept at a low temperature to lessen their vitality. Of 42 mice so treated 8 succumbed to pneumonia whilst, of 22 control animals which were chilled, but did not receive administrations of the organism, none died. It was shown that the organism failed to grow in the absence of X-factor [*i.e.*, the heat-stable derivative of haematin which is necessary for the growth of typical strains of *Haemophilus influenzae*] and that its inclusion in the genus *Haemophilus* is therefore justified.—E. J. Pullinger.

Ochi, Y., & Imai, N. (1937). **Experimental Studies on Production of, and Immunization against Pneumonia in Rabbits.**—*J. Jap. Soc. vet. Sci.* **16.** 32-60 of pt. 1. 17 tables. [Numerous refs]. [In Japanese: abst. from English summary pp. 10-11 of pt. 2].

Employing three local strains of a *Pasteurella* of porcine origin, the authors found that the type of pneumonia produced in rabbits varied with the virulence of the organism. A highly virulent strain produced death from septicaemia in 12-30 hours without the development of a typical pneumonia. A less virulent strain produced acute lobar pneumonia if inoculated intrapleurally, but caused rapid death from septicaemia when given by the intranasal route. Strains of low virulence gave rise to a chronic purulent broncho-pneumonia. Rabbits inoculated with *Brucella bronchiseptica* did not develop pneumonia.—N. J. Scorgie.

Truche, G., & Isnard J. (1937). Un nouveau cas de pseudo-tuberculose chez la poule. [**Pseudotuberculosis in Fowls**].—*Bull. Acad. vét. Fr.* **10.** 38-40. [1 ref.]

The authors describe a lingering series of cases in breeding stock (11 deaths in 11 months amongst 57 birds). P.M., nodular lesions varying in size and definitely fibrous were seen on the intestines and mesentery.

A culture of *Past. pseudotuberculosis* was obtained from bone-marrow. Of 2 g. pigs inoculated with the organism one died in 48 hours and the other in 3½ days. Typical necrotic nodules were to be seen in the liver, spleen and kidneys, and in one the classical lesion in the omentum. These cases are of interest in that, although the infection is well recognized in turkeys, geese and ducks, it does not seem to have been described often in gallinaceous birds.—D. L. Hughes.

Kirst, F. (1936). Beitrag zur Diagnose und Therapie der Colimastitis beim Rinde. [*Bact. coli* **Mastitis in Cattle**].—*Inaug. Diss., Hanover.* pp. 56. 4 tables. [Numerous refs.]

K. gives the clinical symptoms of 22 cases of acute bovine mastitis due to *Bact. coli*. An account is given of the treatment of these cases with infusions of "entozon" and it may be said that the results were not favourable. [A very incomplete study of the bacteriology of these cases was made].—S. J. Edwards.

I. Bakotić, L. (1937). Značenje ishrane u etiologiji paratifa svinja. [**Significance of Nutrition in the Aetiology of Swine Paratyphoid**].—*Jugoslov. vet. Glasn.* **17.** 41-53. 6 tables. [Numerous refs.] [German summary].

II. Butozan, V., & Tončič, S. (1937). Paratifus kod svinja u srezu Kotor Varošu. [**Pig Paratyphoid in a Yugoslavian Province**].—*Ibid.* 199-200.

I. One group of ten pigs was fed on normal, vitamin D-rich food, while another group of ten was kept on a vitamin D-deficient fodder for three months, till symptoms of rickets occurred in the latter group. Both groups were then given a broth culture of *Salmonella cholerae-suis* var. *kunzendorf*, *per os*. All the pigs became sick, but while all of the former group recovered, six of the latter group died, one remained sick and three recovered.

II. Several cases of acute paratyphoid occurred in pigs that had been previously immunized against swine fever. *S. cholerae-suis* var. *kunzendorf* was isolated from animals that had died.—B. Oswald (Split).

Likar, I. (1937). Da li je pitanja tularmje za nas aktuelno. [**Importance of Tularaemia in Yugoslavia**].—*Jugoslov. vet. Glasn.* **17.** 191-195. 3 figs. [9 refs.]

A general description of tularaemia both in man and animals. Though cases of tularaemia have not yet been recorded in Yugoslavia it seems quite possible that the disease may occur in the country, especially as cases have been reported in Austria, near the Yugoslavian frontier. It is inferred that tularaemia may hitherto have been wrongly diagnosed when it has occurred in Yugoslavia.—B. O.

I. Lillie, R. D., & Francis, E. (1937). **Pathology of Tularaemia in the Belgian Hare** (*Oryctolagus cuniculus*).—*Nat. Inst. Hlth Bull.* No. 167. pp. 83-114. 38 figs. on 12 plates, 7 tables.

II. Lillie, R. D., & Francis, E. (1937). **Pathology of Tularaemia in the Black-Tailed Jack Rabbit** (*Lepus sp.*).—*Ibid.* pp. 115-119. 2 figs. on 1 plate.

III. Lillie, R. D., & Francis, E. (1937). **Pathology of Tularaemia in the Cottontail Rabbit** (*Sylvilagus floridanus*).—*Ibid.* pp. 121-126. 5 figs. on 1 plate.

IV. Lillie, R. D., & Francis, E. (1937). **Pathology of Tularaemia in the Cotton Rat** (*Sigmodon hispidus*).—*Ibid.* pp. 127-130. 3 figs. on 1 plate.

V. Lillie, R. D., & Francis, E. (1937). **Pathology of Tularaemia in the California Ground Squirrel** (*Citellus beecheyi beecheyi*).—*Ibid.* pp. 131-139. 5 figs. on 2 plates, 1 table.

VI. Lillie, R. D., & Francis, E. (1937). **Pathology of Tularaemia in the Mouse** (*Mus musculus* **and** *Mus musculus albinus*).—*Ibid.* pp. 141-146. 1 table.

VII. Lillie, R. D., & Francis, E. (1937). **The Pathology of Tularaemia in the White Rat** – (*Rattus norvegicus albinus*).—*Ibid.* pp. 147-154. 2 tables.

VIII. Lillie, R. D., & Francis, E. (1937). **The Pathology of Tularaemia in the Guinea Pig** (*Cavia cobaya*).—*Ibid.* pp. 155-177. 1 table.

IX. Lillie, R. D., & Francis, E. (1937). **The Pathology of Tularaemia in the Opossum** (*Didelphis virginiana*).—*Ibid.* pp. 183-186. 1 table.

X. Lillie, R. D., & Francis, E. (1937). **The Pathology of Tularaemia in Other Mammals.**—*Ibid.* pp. 187-202.

XI. Lillie, R. D., & Francis, E. (1937). **The Pathology of Tularaemia in the Sheep** (*Ovis aries*).—*Ibid.* pp. 179-182.

XII. Lillie, R. D., & Francis, E. (1937). **Pathology of Tularaemia in the Quail (Bobwhite)** (*Colinus virginianus*).—*Ibid.* pp. 203-207. 3 figs. on 2 plates, 1 table.

XIII. Lillie, R. D., Francis, E., & Parker, R. R. (1937). **The Pathology of Tularaemia in Other Birds.**—*Ibid.* pp. 209-211. 1 table.

I. A description of the gross and microscopic pathology of tularaemia which was studied in 127 Belgian hares. Lesions may be classed as being of acute or of subacute type, but both types of lesion may frequently be seen in the same animal. The acute condition is characterized by swelling of the liver and spleen with the formation of circumscribed foci of fibrinocaseous necrosis, the necrosis being either of a pycnotic or a karyorechtic type. In addition to the liver and spleen other tissues may be involved in a similar necrotic process, the lungs and bone-marrow showing a particular tendency to become affected. In the subacute disease proliferating and caseating granulomatous swellings are common in the internal organs, but such lesions may occur side by side with focal necrosis. The foregoing lesions are associated with colonization in the parenchyma cells and in the cells of the reticulo-endothelial system with *Bacterium tularense*. As a result of the destruction of colonized cells septic emboli are produced which in turn give rise to septic infarcts.

II. In the black-tailed jack rabbit the disease tends to be very acute with extensive colonization in the parenchyma and reticulo-endothelial cells.

III. In the cottontail rabbit the process is also acute, but there is a greater degree of parasitization and less thrombosis.

IV. In the cotton rat the chief lesion is one of thrombosis with comparatively little cell parasitization.

V. The disease in the Californian ground squirrel is very similar to that which occurs in the Belgian hare.

VI, VII, VIII, IX & X. The pathological changes in the mouse, rat, g. pig, opossum and other mammals are recorded but show no important difference from those described above.

XI. The natural susceptibility of sheep to tularaemia is doubtful. Four sheep were suspected of having developed this infection, but bacteriological confirmation was lacking. The histopathological findings reported in this paper were somewhat similar to lesions found in diseased rodents, which lends support to the belief that these sheep were actually suffering from tularaemia.

XII & XIII. Quail artificially infected with *Bact. tularense* may develop lesions very similar to those noted in rodents. Many of these birds are, however, insusceptible. The pathology of the disease in other birds is discussed.—E. J. P.

McFadyean, J. (1937). **Bovine Brucellosis.**—*J. comp. Path.* **50.** 69-100.

McF. discusses the development and practical application of the aggl. test for the eradication of bovine contagious abortion. The conditions necessary for the successful eradication of the disease are mentioned and he gives details of the progress made in three infected herds. In two of these, eradication was achieved in a short time by removal of infected animals from the farm. In the third herd, no proper segregation of infected animals could be arranged and during a period of testing lasting 10 years the disease continued to spread and 40 cows and heifers contracted the infection. The disease was eradicated as soon as infected animals were removed from the farm.—S. J. Edwards.

Tchernomoretz, I., & Ellenbogen, V. (1937). **A Note on the Susceptibility of the Syrian Hamster** *Cricetus auratus* **to** *Brucella abortus* **Bang.**—*J. comp. Path.* **50.** 136-140. 3 figs.

By inoculating pure cultures of *Br.a.* from the blood or milk of infected cows into Syrian hamsters, the authors showed that these animals were very susceptible to *Br.a.* infection. Organisms could be recovered from animals examined as early as four days after inoculation with culture. In one case infection was produced with blood of an infected cow. A considerable swelling of the spleen followed infection and this was sometimes in evidence seven days after infection.—S. J. E.

A. Thomsen, A. (1937). Transmission des brucelloses aux diverses espèces animales et à l'homme. [**Transmission of Brucellosis to Various Animals and to Man**].—*Bull. Off. internat. Epiz.* **14.** 88-155. Discussion pp. 409-427. Resolution p. 480. 6 tables.

B. Pereira de Mello, F. F. (1937). Transmission des brucelloses aux diverses espèces animales et à l'homme. [**Transmission of Brucellosis to Various Animals and to Man**].—*Ibid.* 156-178. Discussion pp. 409-427. Resolution p. 480. 10 tables.

C. Mussemeier. (1937). Les modes éventuels d'une prophylaxie des brucelloses animales dans la pratique. [**The Prevention of Animal Brucelloses**].—*Ibid.* 179-190. Discussion pp. 428-439.

A. The author deals with the subject under five headings. The first part concerns the presence of brucella infection in the different species, geographical and zoological distribution and incidence. Tabulated figures, supplied by other delegates, are given for the incidence in the various countries amongst human beings, cattle, goats and sheep, swine, horses, dogs and cats, birds, rabbits, rats and game. Emphasis is laid on the absence of adequate data for cattle, and of the importance of having further figures for goats and sheep in countries in which *Br. melitensis* is present. The tables given show clearly the limitation of *Br.m.* both in animals and man to the Mediterranean countries and the southern part and Pacific states of the U.S.A. (with a few cases in other countries), and the relatively low incidence of *Br. abortus* in both animals and man in these countries, or parts of countries. Similarly, with a few exceptions, *Br.m.* is limited to goats and sheep and *Br.a.* to cattle (human beings excepted). Abortion amongst swine is now a serious problem in the U.S.A. and the U.S.S.R. only. Part II deals further with the role of the different types in the various species. Part III deals with transmission from one species to another. Some alarm is expressed regarding infection of bovines with *Br.m.* of which some cases have been reported in France, Italy and North America, and the possible danger to human beings of the milk of such cows, which might become serious if, as is possible, it spreads from cow to cow.

Part IV deals with methods of infection in the various species, particular attention being drawn to two methods of infection to which increased importance has been attached in recent years, *viz*, contact infections which are looked upon as important and perhaps predominant – tables being quoted to show the relatively high incidence of infection amongst veterinarians, shepherds, cowmen, etc. – and conjunctival infection which is considered to play probably a considerable role in practice, *e.g.*, in veterinarians. Consumption of animal products is believed to play a minor role.

Part V deals with prophylaxis in man and animals. T. recommends vaccination of all veterinarians with three doses (subcut.) of formolized culture, and outlines certain precautions to avoid infection. A good illustration of the characteristic skin reaction to brucella products is given.

B. Brucellosis in Portugal is dealt with. *Melitensis* infection in human beings has been known since 1893, but *abortus* infections are relatively rare. Brucellosis of animals is present in most districts, having been found in cattle, goats, sheep and horses; all varieties exist. It is concluded from experiments that the most effective routes of infection are (in the following order) :– nasal, scarified skin, ocular, intact skin, and finally the oral and genital routes. In practice the route of infection is determined largely by the conditions under which the animal lives. In man no distinction is made between the incidence of contact and alimentary infections. A plea is made for a collaborated effort on behalf of all health services, human or animal.

C. The author confines his report to brucellosis amongst cattle, believing that, apart from the goat infection, it is the only form of brucellosis of really considerable economic importance.

He emphasizes the necessity for energetic measures to protect herds which are at present uninfected, a policy which has always been a major consideration with the more highly contagious diseases, but appears to have been overlooked in connexion with the chronic diseases, *e.g.*, contagious abortion and tuberculosis. Diagnosis is difficult and so, therefore, is compulsory notification. Accurate statistics regarding incidence are necessary before actual methods can be decided upon in any given area. So far, attention has been directed mainly towards the

disease in infected herds, living vaccine having been widely used. In favourable cases, the number of abortions have been thereby decreased, but the disease has not been eradicated or its spread prevented. On principle vaccination with living culture should be forbidden, except for experimental purposes.

The author outlines plans for control and eradication :– I. Measures suited to countries with a few infected herds (*i.e.*, less than 15%) :– (1) testing of all herds and sale of animals from infected herds only for slaughter or to herds kept solely for milk production (presumably recruited solely by purchase) or fattening ; (2) heating of all milk, and (3) prevention of persons working in infected herds from entering other herds unless disinfected, etc. II. Measures suited to countries with a high percentage of infected herds, *viz*, concerning traffic in animals, bulls, communal pastures, the movements of personnel, quacks and milkers ; and concerning creameries. III. Suggestions for a voluntary but officially directed or recognized scheme of control, including the conditions under which a herd could be recognized as uninfected, the precautions necessary to keep it so, and the measures necessary for the eradication of the disease in infected herds. M. believes that the main sources of spread are the traffic in animals, the return products of creameries and the circulation of personnel. He stresses the importance of maintaining a high standard of general health and of nutrition.

Whilst fully realizing the difficulties ahead, he is emphatic that abortion can only be controlled by energetic measures and that some inducement to owners to co-operate by giving certain privileges to uninfected herds is necessary. Eradication is easiest in self-contained herds ; it should be possible in certain areas even of badly infected countries.

Discussion.—Considerable discussion followed, in the course of which it was stated that a trial of wheat germ oil in Tunis (Cottier) had not shown it to be of any value. There was considerable difference of opinion regarding the advisability of a resolution officially condemning living brucella vaccine. The article itself and the subsequent discussion must be consulted for details of the scheme and the various comments on it.

Resolution.—The Committee (1) requests that enquiries on brucelloses be made by co-ordinated action of medical and veterinary authorities according to a pre-arranged plan, and (2) believes that the principles and methods of prophylaxis of the animal brucelloses by sanitary measures in the field, formulated by Müssemeier, must be adhered to and made use of as a basis of action.—A. W. S.

Delez, A. L. (1937). **Brucellosis in Dogs Associated with Bang's Disease in Dairy Cattle.**—*J. Amer. vet. med. Ass.* **91.** 332-334. [4 refs.]

D. records a case in which a bitch was suspected of spreading *Brucella abortus* infection to a herd of cattle. The bitch's serum showed an agglutinin titre of 1 : 100, but attempts at isolation of the organism from the organs of the animal after death were unsuccessful.—N. J. Scorgie.

Rodrigues, C. (1936). Estudos sobre o " Clostridium chauvoei " variaçoes na morphologia das colonias. [**Variations in** *Cl. chauvoei*].—*Arch. Inst. biol. Def. agric. anim., S. Paulo.* **7.** 235-244. 1 text fig., 37 figs. on 7 plates, 2 tables. [7 refs.] [English summary].

This is a detailed description, with numerous photographs, of various types of colony of *Cl. chauvoei*, from a study of 20 laboratory strains and 14 recently isolated cultures. The original must be consulted for details.—S. Torres.

Miessner, H., & Schoop, G. (1937). Das Novyödem und seine Bekämpfung. [**Gas Gangrene Due to** *Clostridium oedematiens*].—*Dtsch. tierärztl. Wschr.* **45.** 369-376. 20 tables.

The report of an investigation of the incidence of *Cl. oedematiens* infection in Germany from 1928-1936. Numbers of cases suspected to be due to anaerobic infection were examined, and of these, 34·7% of the 92 cases in cattle were found to be due to the organism, 33·3% of the 84 in horses, 28·5% of the 151 in pigs, and 31·6% of the 412 in sheep. These organisms invade the animal host *via* a wound and produce an oedematous type of lesion largely due to toxin formation, for organisms are not plentiful in infected tissue. A combined infection with *Cl. septique* is sometimes found and mixed vaccines or antisera may be used for protective or curative purposes.—E. J. Pullinger.

Emmons, C. W. (1936). **Strains of Actinomyces bovis Isolated from Tonsils.**—*Puerto Rico J. publ. Hlth.* **11.** 720-727. 9 figs. on 2 plates. [6 refs.] [Spanish version pp. 728-735]. [Copied *verbatim* from *Bull. Hyg., Lond.* **11.** 919. Signed R. Lovell].

There has been some difference of opinion regarding the source of infection in actinomycosis, but many investigators now believe that the causal organism of the human and animal disease – *Actinomyces bovis* – may often be present in the mouth without producing actinomycosis.

Accordingly 100 pairs of tonsils from consecutive tonsillectomies performed at two hospitals in San Juan, Porto Rico, were examined microscopically and in 47 of them what appeared to be actinomyces were observed. The growth of a micro-aerophilic actinomyces in dextrose veal infusion agar shake cultures was obtained in 23 and isolated in pure culture in 10 of them. The organism isolated corresponded in its staining reactions, oxygen requirements and morphological characters to *Actinomyces bovis*. Should these characters form a sufficient basis for its identification, then it is concluded that *Actinomyces bovis* exists as a saprophyte in the crypts of the tonsils, and that from there it may invade more susceptible tissues and give rise to actinomycosis.

Houzé. (1937). La lymphangite épizootique de l'âne. [**Epizootic Lymphangitis in Donkeys**].—*Bull. Acad. vét. Fr.* **10.** 231-234. 1 fig. [7 refs.]

This is the first case of epizootic lymphangitis in an ass reported from Algeria, where H. believes it is by no means uncommon in this species. Clinically, the disease was similar to that observed in horses and mules. Cultural examination of pus from the lesions indicated that the causal organism was *Cryptococcus farciminosus* (Rivolta).—N. J. Scorgie.

Baumann, R. (1937). Ein Beitrag zur Klärung der Aetiologie der Mycosis fungoides des Hundes. [**Mycosis fungoides in the Dog**].—*Zlb. Bakt. I.* (*Orig.*). **138.** 241-244. 4 figs. [4 refs.]

This condition was first associated with the finding of acid-fast bacilli by Wirth and Baumann in 1932 [*Virchows Arch.* **286.** 651]. The case which B. describes as mycosis fungoides appears to be typical tuberculosis of the bronchial and mediastinal glands of a dog, with secondary lesions in the liver. Acid-fast bacteria were found in smears only after prolonged search in histological sections; none were found in smears. They were in the form of thin, interrupted, bent rods.

Cultural experiments and inoculation of laboratory animals revealed the organism to be of the human type, but of low virulence. [The description of the

lesions agrees exactly with the findings in spontaneous TB. in dogs involving the bronchial and mediastinal glands. The extreme difficulty encountered in finding the organism is a feature of such cases].—E. G. White.

Bürgers, J. (1934). Ueber Pleomorphie der Bakterien. [**Pleomorphism in Bacteria**].—*Schr. königsb. gelehrt. Ges. naturw. Kl.* **11.** 87-100. 8 figs. on 2 plates. Halle (Saale): Max Niemeyer. [8vo] [RM.2.20].

This is a historical essay on pleomorphism of micro-organisms and an account of atypical types of cultures encountered by B. during the course of his work on medical microbiology. Theories to account for pleomorphism are discussed.—J. E.

DISEASES CAUSED BY PROTOZOAN PARASITES.

Ter-Matevossian, S., Sarkissian, M., & Zaturian, A. (1936). **The Pathogenicity to Kittens of Strains of *Entamoeba histolytica* Occurring in Armenia.**—*Med. Parasitol., Moscow.* **5.** 108-118. [In Russian]. [Copied *verbatim* from *Trop. Dis. Bull.* **34.** 326. Signed C. A. Hoare.]

The authors tested the virulence for kittens of four strains of *Entamoeba histolytica* isolated in culture from cases of distinct forms of amoebiasis in Armenia: one of acute dysentery: another of untreated chronic amoebiasis: the third of a chronic case treated with emetine, and the fourth from a symptomless carrier.

Altogether fifty-two kittens were inoculated with cultures *per rectum* and their faeces were examined daily. All the strains of amoebae used proved to be pathogenic to kittens in various degrees, the one isolated from the acute case being most virulent, those from the chronic cases less so, and the one from the "carrier" case the least.

I. DeVolt, H. M., & Davis, C. R. (1936). **Blackhead (Infectious Entero-hepatitis) in Turkeys, with Notes on other Intestinal Protozoa.**—*Bull. Md agric. Exp. Sta.* No. 392. pp. 493-567. 15 figs., 8 tables. [Numerous refs.]

II. Bayon, H. P. (1937). **The Pathology of Histomonas Entero-Hepatitis in Turkeys and Other Birds.**—*Vet. Rec.* **49.** 1010-1015. 1 fig. [Num. refs.]

I. This exhaustive study of the experimental disease is divided into the following sections:– the control of blackhead by rearing poults in experimental colony houses; various methods of transmission; the isolation of the causal organism in protozoan pure culture and its identification; the relation of the clinical and parasitological periods; and a description of other protozoa that may occur in turkeys and be confused with *Histomonas meleagridis*.

The authors found that poults could be raised free from the disease by incubator hatching and rearing in isolation from adult turkeys or chickens, and away from contaminated soil. Flies may be suspected as transmitters of the disease. Tyzzer's "inoculated blackhead" was reproduced by inoculation (subcut.) of liver lesions, and a new experimental form of the disease resulted from the implantation of the same material in the nasal sinuses. Protozoan pure cultures were obtained by inoculating Locke's egg medium with caecal droppings from experimental birds. Trichomonads may occasionally be found in livers affected with blackhead, and it is possible that they may be concerned in the pathogenesis of the disease. Death occurred in young poults 9-15 days after inoculation; symptoms appeared in 4-9 days, and the causal organism was voided in the faeces before the appearance of symptoms.

II. This article consists of a general description of the disease. A good

account is given of its symptoms, and of its morbid anatomy and histology. The work of Enigk (1935) [*V. B.* **6**. 533.], who claims to have incriminated a blastomycete in this disease, is mentioned and a reply made to Enigk's criticisms of the work on the aetiological significance of *H.m.* The role of *Heterakis* worms in blackhead is not considered to be important, at least in Great Britain.

The methods of prevention recommended are hygienic conditions and the provision of a diet with a satisfactory vitamin A content. The results of the removal or ablation of the caeca do not appear to justify the trouble or risks involved. In early cases an arsenical preparation ("hepastab") appeared to be of some value.—D. L. Hughes.

I. Brown, J. C., & Brown, H. C. (1937). **Studies in Trypanosomiasis. I. The Electric Charge of Trypanosomes in Tsetse Flies.**—*Trans. R. Soc. trop. Med. Hyg.* **31**. 81-86. 1 table. [2 refs.]

II. Corson, J. F. (1937). **Further Observations on a Strain of** *Trypanosoma gambiense*.—*Ann. trop. Med. Parasit.* **31**. 275-283. [5 refs.]

III. Fairbairn, H. (1937). **The Infectivity to Man of a Strain of** *Trypanosoma rhodesiense* **Transmitted through Sheep by** *Glossina morsitans*, **and its Resistance to Human Serum** *in vitro*.—*Ibid.* 285-291. 2 tables. [7 refs.]

IV. Lourie, E. M., & O'Connor, R. J. (1937). **A Study of** *Trypanosoma rhodesiense* **Relapse Strain** *in vitro*. *Ibid.* 319-340. 7 tables. [Num. refs.]

I. The authors record that after ingestion by *G. morsitans* positively charged strains of *Tryp. brucei* no longer become attached to the red corpuscles in blood diluted with glucose-saline, but that the prevention of adhesion is due to the action of some constituent in the gut of the flies, and can be overcome by washing the trypanosomes. They found that negatively charged trypanosomes ingested by *G. m.* remained negatively charged in the intestine of the fly, but that positively charged strains tended to change to negative 24 hours after ingestion. Trypanosomes of positively charged strains recovered from the guts of the tsetse flies and inoculated into mice produced positively charged infection. Although infection with gut forms can usually only be produced up to 72 hours after ingestion by the fly, in one case inoculation with fly-gut contents 22 days after ingestion proved successful. It is uncertain whether the mouse infections exhibiting a positive charge resulted from residual positive gut forms or not. Development forms in the guts of flies were all negatively charged.

II. C. records further investigations into a strain of *Tryp. gambiense* transmitted by *G.m.*, undertaken to assess the probability of a relationship between *Tryp. gambiense* and *Tryp. rhodesiense*. Strains were selected from three g. pigs which had exhibited acute infections with the *gambiense* strain, in one of which posterior nuclear forms had appeared. These strains were passaged through rats and g. pigs, but failed to maintain their enhanced virulence which, it is concluded, depended on the individual susceptibility of the host. It is pointed out that it is not easy to draw conclusions from the behaviour of one strain, but that it appears difficult for a strain of *Tryp. gambiense* to change to the *Tryp. rhodesiense* type, and that all strains of human sleeping sickness from Uganda and German East Africa (except from the Rovuma river) were of the *gambiense* type, although *Tryp. brucei* existed in the areas at the time of their collection. Strains of human sleeping sickness from Nyasaland, Rhodesia and Tanganyika, all conform to the *rhodesiense* type at the present time. It is thought that there may be good reasons for regarding the three polymorphic trypanosomes as one species for purposes of classification, but that it is not yet known whether any one of them can change into either of the other two.

III. F. records that a strain of *Tryp. rhodesiense* which had proved infective to man after maintenance in sheep for 16 months and after 7 sheep passages, still proved infective to man after 22 months and 11 passages, although *in vitro* it was susceptible to human serum, including that of the author who proved susceptible to inoculation. It is urged that old laboratory strains of human trypanosomes, which have been maintained in Europe, should be inoculated into volunteers to ascertain how long the power of infecting man can be retained.

IV. The authors working with *Tryp. rhodesiense* maintained in mice, noticed that about once in 1,000 passages the incubation period was prolonged from the normal five days to seven days or more. They found that the strains resulting from such infections differed from the parent strains in their resistance to the lytic action of mouse immune serum, and they name them " spontaneous variants ". In addition to these spontaneous variants they produced relapse strains in mice by the administration of subcurative doses of " halarsol ", and investigated the immunological qualities of 22 such strains by their resistance to the lytic action of various types of immune mouse serum. In the 22 strains examined, 13 distinct immunological types of trypanosomes were present, and in 7 strains mixtures of two types occurred together. The immune serum produced by infecting a mouse with a strain containing several types of trypanosomes is lytic against the organisms of each type.—U. F. Richardson.

Morenas, L., & Ronan, E. (1937). Transmission héréditaire de *Trypanosoma brucei* chez le rat. [**Hereditary Transmission of** *Tryp. brucei* **in Rats**].—*Bull. Soc. Path. exot.* **30.** 376-379.

Of 15 experiments, in which the blood of new-born rats or of foetuses from mothers infected with *Tryp. brucei* was subinoculated into other rats, 2 gave positive results and 13 negative results. In the authors' opinion it must be accepted that hereditary transmission of *Tryp. brucei* may occur but that such transmission is rare.—U. F. Richardson.

Schwetz, J. (1937). *Trypanosoma suis* Ochmann, 1905, *Trypanosoma porci* Schwetz, 1932, ou *Trypanosoma simiae* Bruce, 1912 ? A propos de la nomenclature de la trypanosomiase virulente du porc. [**The Nomenclature of the Virulent Porcine Trypanosomes**].—*Bull. Soc. Path. exot.* **30.** 501-511. [17 refs.]

S. discusses the correct name for the virulent trypanosome of pigs and agrees with Mesnil that the photomicrographs of *Tryp. suis*, encountered by Ochmann in 1905, reveal a trypanosome of the *congolense* group, intermediate between *Tryp. congolense* and *Tryp. montgomeryi*, and not a trypanosome of the *brucei* group as believed by Wenyon and Hoare. As Ochmann recorded the trypanosome as being associated with an acute disease of pigs there is little doubt he was dealing with the same organism as that described by Bruce (1912) under the name *Tryp. simiae* and by S. (1932) under the name *Tryp. porci*. It is, therefore, claimed that the name *Tryp. suis* has priority, and that the objection that the description of the organism was not sufficient is invalid, as the same objection can be advanced against the name *Tryp. simiae*, in view of Bruce's failure to describe its polymorphic characters.—U. F. Richardson.

Kalabuchov, N. P., & Levinson, L. B. (1936). **The Effect of Low Temperature upon Trypanosomes** (*Trypanosoma equiperdum*) **in the Organism of Mammals.**—*C. R. Acad Sci. U.R.S.S.* **1.** 47-50. 2 tables. [9 refs.] [In English]. [Copied *verbatim* from *Exp. Sta. Rec.* **75.** 541].

Experiments are reported in which two species of bats (*Nyctalus noctula* Schr. and *Pipistrellus nathussi* Keys & Blas.) were infected with *T. equiperdum*, which multiplied very quickly. It was found that at a temperature ranging from 3° to 4°C. (body temperatures of from 3·5° to 6·7°), infection in the bats did not develop at all, and did not develop later when the bats were warmed. Placed in ice boxes on the third or fifth day after the number of trypanosomes in the blood had reached a high level, they disappeared and failed to reappear in the blood after exposure to normal temperatures.

GIRAUD, P. (1936). Epidémiologie du kala-azar dans la région marseillaise. [**Epidemiology of Kala Azar in the Marseilles District**].—*Marseille méd.* **73.** 81-92. [Copied *verbatim* from *Trop. Dis. Bull.* **34.** 567. Signed C. M. WENYON].

Writing of kala azar in the district of Marseilles, the author notes that the disease became apparent in 1922 since when about 146 cases have been recorded, of which 135 were autochthonous. Of the 146 cases, 5 were in adults and 4 in adolescents, the rest being in children. The endemic area does not extend west of the Rhone, while to the east it is continuous with other endemic foci up to the Italian border. In a northern direction 100 kilometres is its limit. In the Marseilles region particularly the dry, scrubby districts are those most affected and it is in these regions also that "fièvre boutonneuse" is most common. This disease is admittedly conveyed from dog to human being by the tick, and the author thinks that a similar mode of infection may occur in the case of kala azar. He puts aside any idea of direct contagion from case to case and though admitting that sandflies are common in the kala azar districts, he observes that they are by no means limited to or most abundant there. Furthermore they feed upon adults as well as children, which is not the case with dog ticks, which readily attack the children of the poor who, in these areas, live most of their young days out of doors and in close contact with the ground. The author admits that proof of tick transmission has not yet been obtained, but he thinks that further work on the subject should be carried out. It appears that the incidence of infection in dogs is very high and that they are to be regarded as reservoirs of the leishmania infection. In fact the disease in dogs came to light in this district some years before human cases began to be discovered.

BULIK, P. (1937). Zagadnienie rzesistka bydlecego, w zwiazku z badaniami nad jego rozprzestrzenieniem w Polsce. [**Trichomonads in Poland**].—*Przegl. wet.* **52.** 76-100. [Numerous refs.] [German summary].

Trichomonads were found in the uteri of 17 out of 27 cows affected with metritis. The uteri of 50 healthy cows were examined also, but no trichomonads were found.—A. SZWABOWICZ (Lwów).

I. PASCAL. (1937). Existence de la piroplasmose bovine dans la région d'Arles dû à *Pir. Bigemina*. [**Piroplasmosis in Cattle in Arles, France**].—*Bull. Soc. vét. prat. Fr.* **21.** 30-33.

II. REES, C. W. (1937). **The Effects of Exposure to Different Degrees of Temperature on the Etiological Agents of Bovine Anaplasmosis and Piroplasmosis.**—*J. Parasit.* **23.** 175-182. 1 table.

III. BUCK, G. (1937). Existence de *Babesiella berbera* à Madagascar. [*Babesia berbera* **in Madagascar**].—*Bull. Soc. Path. exot.* **30.** 436-437. [8 refs.]

I. P. investigated an outbreak of disease associated with redwater in a herd of 50 young bulls at Arles. Piroplasms were detected in the blood and the bulls

were infested with *Ixodes ricinus*. Treatment with injections (intraven.) of 1 g. " gonacrine " [acriflavine] were given as soon as a supply of the drug could be obtained, and 40 of the animals recovered. It is stated that similar outbreaks have occurred in the Arles area for the last eight years, but that the disease has been mistaken for anthrax.

II. R. conducted experiments to ascertain how long piroplasms and anaplasms would remain infective in washed red corpuscles exposed to various degrees of heat and cold. The parasites were still infective after 18 hours freezing. The results of exposure to heat varied somewhat in the different experiments, but exposure to 45°C. for 10 minutes failed to kill either anaplasms, *B. bigemina* or *B. argentina*. Twenty minutes exposure to 60°C. killed the babesia, but usually failed to kill anaplasms. In one instance a mild attack of anaplasmosis resulted from infection with heated corpuscles, and the incubation period was lengthened from 15 days to 30 days when heated material was used. Anaplasms which had been killed by heat had no value as an immunizing agent. In one case the virulence of *B. bigemina* appeared to be reduced by heating at 45°C. for 15 minutes.

III. B. records the detection of *B. berbera* in Madagascar. The infected calf showed debility and loss of appetite, but neither fever, jaundice or haemoglobinuria occurred. *B. bigemina* was found in the blood of the same animal but the death was ascribed to *B. berbera*.—U. F. Richardson.

Sanders, D. A. (1937). **Observations on Canine Babesiasis (Piroplasmosis).**—*J. Amer. vet. med. Ass.* **90.** 27-40. 9 figs., 1 table. [16 refs.]

S. records investigations into piroplasmosis of dogs in Florida. The disease occurs in a chronic form, the causal organism being difficult to demonstrate, and, even in subinoculated puppies, was often only definitely recognizable after splenectomy. Chronic cases of this nature have a low blood haemoglobin content and exhibit anaemia, pallor of the mucous membranes, loss of condition and weakness, intermittent fever and the presence of ticks. In the later stages, jaundice may occur and in this case haemoglobinuria may also be present. The animals respond to treatment with trypan blue. It is pointed out that the disease is transmitted by *Rhipicephalus sanguineus* which has a wide distribution in the U.S.A., and in the north may survive indefinitely in heated buildings. It may also be transmitted by *Ixodes ricinus* and by *Dermacentor andersoni* of the Rocky Mountains. In the discussion Wells warned veterinary practitioners not to overlook the possibility of piroplasmal infections, again emphasized the difficulty of demonstrating the parasites, and pointed to the prevalence of filarial infections as evidence that what might be regarded as purely tropical diseases can be spread throughout the U.S.A.—U. F. Richardson.

Mlinac, F., & Šterk, V. (1937). Anaplasmoza goveda u Južnoj Srbiji. [**Anaplasmosis of Cattle in Southern Serbia**].—*Jugoslov. vet. Glasn.* **17.** 195. 1 fig. [3 refs.] [German summary].

This is the first case of anaplasmosis recorded in Yugoslavia. The animal in question was an ox from the vicinity of Skoplje, Southern Serbia. In the blood smears intracorpuscular bodies corresponding to *Anaplasma marginale* were found.—B. Oswald (Split).

Stiles, G. W., Jr. (1937). **Observations on Anaplasmosis in Idaho.**—*J. Amer. vet. med. Ass.* **90.** 212-214. 1 table. [1 ref.]

Anaplasmosis is reported from the state of Idaho. The diagnosis was made by field investigation and by microscopic examination of blood smears, and was

confirmed by animal inoculation. Anaplasmosis has been observed and reported from 19 states in the United States.—G. Williamson.

Rubarth, S. (1937). Weils sjukdom hos hund och räv. [**Leptospirosis in Dogs and Foxes**].—*Skand. VetTidskr.* **27.** 285-306. Discussion pp. 307-309. 4 figs. [Numerous refs.] [English and German summaries].

During the year ending April 1937, leptospirosis was detected in 8 dogs, 11 silver foxes and one blue fox at the Institute of Pathology, Stockholm Veterinary College. R. reviews the literature, and gives a general description of the infection, dealing with its history, descriptions as to the causal organism, symptoms, diagnosis, P.M. changes and prognosis. The two main types of the disease are discussed, the icteric form and the form without this symptom. The relationship of the latter to Stuttgart disease is given consideration.

In Sweden leptospirosis seems to be of rather sporadic occurrence, but a few observations indicate that, in some instances, both in dogs and foxes, it may be enzootic.

An abstract of the discussion that followed the reading of the paper is appended.
—Gustav Naerland (Oslo).

I. King, N. S. (1937). **Stuttgart Disease and Nephritis.**—*Vet. Rec.* **49.** 1195-1206. [Numerous refs.]

II. Wirth, D. (1937). Leptospirose (Weilsche Krankheit) bei Tieren. [**Leptospirosis in Animals**].—*Zlb. Bakt. I. (Ref.).* **125.** 239-240.

III. Schlossberger, H. (1937). Ueber Weilsche Krankheit und Stuttgarter Hundeseuche. [**Weil's Disease and Stuttgart Disease of Dogs**].—*Ibid.* 332-336.

IV. Schlossberger. (1937). Neue Feststellungen über Weilsche Krankheit und Stuttgarter Hundeseuche. [**New Findings about Weil's Disease and Stuttgart Disease of Dogs**].—*Reichsgesundheitsblatt.* **12.** 521-523. 3 tables.

V. Seydler, B. (1937). Beitrag zum Problem der Stuttgarter Hundeseuche. [**Stuttgart Disease**].—*Tierärztl. Rdsch.* **43.** 302-307. [Numerous refs.]

VI. Wirth, D. (1937). Zur ursächlichen Bedeutung der Leptospiren bei der sog. Stuttgarter Hundeseuche. [**The Aetiological Importance of Leptospira in Stuttgart Disease**].—*Ibid.* 547-551. [8 refs.]

VII. Berger, F. (1937). Leptospiren bei Weiner Kanalratten. [**Leptospira in Vienna Canal Rats**].—*Wien. tierärztl. Mschr.* **24.** 540-541.

VIII. Pass, G. (1937). Leptospiren bei Mäusen. [**Leptospira in Mice**].—*Ibid.* 541.

I. The symptoms of nephritis in dogs are described in some detail and the available methods of diagnosis are discussed. While considering the possible causes of nephritis a comparison is drawn between nephritis, leptospiral jaundice, blacktongue (probably due to vitamin B deficiency) and the clinical syndrome known as Stuttgart disease. It is concluded that the name Stuttgart disease is often applied indiscriminately to the other three conditions. Nephritis is not a specific disease in dogs but rather a pathological condition arising from a number of causes, including leptospiral jaundice and blacktongue.

II. Leptospira have been identified as infecting a large proportion of rats and mice around Vienna, and dogs so infected are sometimes encountered showing the Stuttgart syndrome. *Ante-mortem* diagnosis of leptospiral infection in the dog depends upon demonstration of the causal organism in the urine when examined microscopically with dark field illumination; P.M. diagnosis consists of demonstration of the organism in suitably stained sections of tissue (particularly

kidney). If young puppies are inoculated with contaminated material, they develop acute jaundice ; young g. pigs similarly inoculated do not develop disease, but leptospira can be demonstrated in the peritoneal fluid 3-4 days after inoculation (intraperit.) with infected material. This peritoneal exudate may then be used for culture of the organism.

III. Blood from a certain proportion of dogs showing the Stuttgart disease syndrome contained antibodies against *Leptospira icterohaemorrhagiae*. The Stuttgart syndrome may arise from a number of causes other than leptospiral infection, one of these being dog distemper.

IV. Blood serum from two human patients produced slight agglutination of a canine strain of leptospira. All 25 samples of human serum tested gave strong agglutination with human or rat strains. Of samples of serum from 25 dogs suffering from the Stuttgart syndrome all agglutinated leptospira and in at least 14 cases leptospira of human origin were strongly agglutinated. Serological analysis showed that, whilst antiserum prepared against canine strains of leptospira agglutinated canine, human and rat strains of the organism, antiserum prepared against human or rat strains rarely agglutinated canine strains.

V. This reports the treatment with " spirobismol " of conditions diagnosed as Stuttgart disease ; no conclusive results were obtained.

VI. Leptospiral infection in the dog may be demonstrated by microscopic examination of the urine, by the examination of silver-impregnated tissue sections or by the inoculation of puppies or g. pigs. Merely to demonstrate the presence of leptospira is not conclusive evidence that they are the cause of the disease, as they may be secondary invaders. Reports of clinical and laboratory investigations are given which lend weight to the hypothesis that leptospira are the primary cause of one of the conditions known as Stuttgart disease. *In vitro* " trypaflavine ", " rivanol ", and corrosive sublimate are lethal to leptospira in high dilution, whilst strong concentrations of acaprin, formalin, " spirobismol " and " neosalvarsan " are necessary to destroy these organisms.

VII & VIII. About 40% of canal rats and 15% of mice from the neighbourhood of Vienna were found to be infected with leptospira.—E. J. Pullinger.

I. Alston, J. M., & Brown, H. C. (1937). **The Epidemiology of Weil's Disease.**—*Proc. R. Soc. Med.* **30.** 741-756. 3 figs., 1 table, 2 maps. [Numerous refs.]

II. Smith, J. (1937). **Vaccination of Guinea-Pigs and Human Beings against Leptospiral Infections.**—*J. Hyg., Camb.* **37.** 261-270. 4 tables. [Numerous refs.]

I. The authors review the literature upon this disease since its first description in 1886. They show that there is scanty evidence of its existence in India, Egypt, Arabia and Iran, probably because bright sunlight is so lethal for the causal organism. Acid conditions and salt water are also lethal factors which may account for its varying distribution, the greatest prevalence being in Holland, France, the Malay States, Sumatra and the Andaman Islands. Small rodents, chiefly rats, carry the disease and spread it by their urine. Dogs and foxes contract the infection.

In the British Isles 142 definite clinical cases have been reported in the three and a half year period ending February, 1937, the mortality rate being 15%.

The serological differentiation of leptospira and the relationship of saprophytic to pathogenic species are discussed.

II. Vaccination of g. pigs with non-virulent living cultures or with virulent cultures killed by heat or chemicals renders them immune to virulent strains of

Leptospira icterohaemorrhagiae. Homologous strains gave better vaccinal results than *L. hebdomadis* or *L. icterohaemorrhagiae* (non-virulent Indian strain). A lytic titre of blood sera of 1 : 6 seemed to indicate a solid immunity. The lytic titre of an immune serum for living cultures is almost identical with the agglutinin titre for formolized cultures, but S. shows that, in g. pigs, the lytic titre was higher if living non-virulent cultures were used than if they were injected with killed cultures. A carrier condition developed in g. pigs after a test dose of virulent strains of *L. icterohaemorrhagiae* following vaccination with killed homologous cultures or living non-virulent heterologous cultures. Only killed cultures of *L. icterohaemorrhagiae* were tried for vaccination of human beings. Blood tests, after injection (subcut.) of 1 c.c. and 2 c.c. doses, showed relatively small lytic antibody production and the need for increased dosage.—C. V. Watkins.

DISEASES CAUSED BY VIRUSES.

I. Doerr, R. (1936). Allgemeine Merkmale der Virusarten. [**General Characteristics of Viruses, including Bacteriophage**].—*Z. Hyg. InfektKr.* **118.** 738-747. [Numerous refs.]

II. Doerr, R., & Seidenberg, S. (1936). Zur quantitaven Auswertung filtrierbarer Virusarten. [**Quantitative Evaluations of Filtrable Viruses**].—*Ibid.* **119.** 1-9. 4 tables. [11 refs.]

I. A brief review article serving as a valuable guide to the essential researches upon which the modern concepts of the nature of viruses and bacteriophage are based. In attempting to decide upon the nature of viruses it is necessary to consider on the one hand their great resistance under certain conditions and the fact that one at least (mosaic disease of tobacco) has been identified as purified crystalline protein ; on the other hand viruses are known to multiply under suitable conditions, produce inclusion bodies in the animal host which suggest colony formation, and they are antigenic, stimulating progressive antibody production. If the foregoing factors are weighed, the balance of evidence is in favour of the hypothesis that viruses and bacteriophage are ultra-small micro-organisms and not inert colloidal substances arising perhaps from autolysis of the host tissues.

II. Whilst normal saline and phosphate buffer solution are both toxic for fowl plague virus, normal serum from fowls or rabbits, diluted 1 : 10 with normal saline, serves as an excellent diluent which causes no destruction of virus in the course of a week's storage. In standardizing virus, attention should, therefore, be paid to the diluent. If a minimal infective dose of virus is divided into 10 parts, and 10 susceptible animals are inoculated with one part each, it is found that perhaps three of the animals develop infection and the remainder survive. Such a result indicates that virus is particulate, the three infected animals having received the residual virus particles which constituted the estimated minimal infective dose. Since virus is particulate it is inevitable that in any standardization experiments irregular results will be obtained when working in that indefinite zone which lies between the definitely infective and the definitely non-infective dose.—E. J. P.

Cilli, V. (1937). Il problema della peste bovina nell'Africa Orientale Italiana. [**Rinderpest in Italian East Africa (Eritrea, Italian Somaliland and Abyssinia)**].—*Nuova Vet.* **15.** 91-103. [Also appeared in *Azione vet.* **6.** 409-412].

C. reviews experience gained in dealing with rinderpest in South Africa, Egypt, Uganda, the Gold Coast, French West Africa and the Philippines. He

emphasizes that it is dangerous to imitate measures taken in South Africa following on an epidemic that swept away over 5,000,000 head of cattle, and left the majority of the survivors immune. Moreover, conditions in that country admit of measures to prevent the importation of disease from outside, which are not always practicable elsewhere. He insists that all known methods of immunization with vaccine afford only brief immunity, whereas animals that have had the disease and recovered, remain immune. He argues in favour of serum-virus inoculation. As regards Italian East Africa he considers intensive slaughter of infected animals is impracticable, but recommends isolating Eritrea and the use of serum-virus inoculation in Abyssinia. He promises further experiments on the resistance of the virus in frozen meat.—S. F. J. Hodgman.

Drouin. (1937). Sur l'épidémiologie de la fièvre aphteuse. [**Epidemiology of Foot and Mouth Disease**].—*Bull. Acad. vét. Fr.* **10.** 195-197.

Periodicity is discussed from the point of view of the number of the departments of France in which the disease occurred over a period of 50 years. The number showed wide variations from time to time without any definite periodicity and without apparent reason, except that at the end of the Great War it might be attributed to the increased movement of animals into devastated areas. This period showed the highest degree of infection.

From 1922 to 1933 the number of infected departments did not fall below 20. In 1934 a rapid fall occurred in seven departments, the improvement being maintained until 1937. An increase in the number of infected departments was associated with a more severe type of disease. Generally, an increase in the disease in France coincided with an increase in Eastern Europe.

D. considers that when the number of infected departments is small a policy of slaughter of infected animals should be introduced.

In the discussion Leclainche indicated that he did not agree with the latter policy. He discussed the results of a similar policy in Great Britain, the problem of the conservation of the virus in nature, and its rapid changes in virulence. —F. H. Manley.

I. Boms, P., & Terhedebrügge, H. (1937). Die Trennung des Pockenvirus vom Virus der Maul- und Klauenseuche mittels physikalischer, chemischer und biologischer Methoden. [**Separation of Pox Virus from Foot and Mouth Disease Virus by Physical, Chemical and Biological Methods**].—*Zlb. Bakt. I.* (*Orig.*). **138.** 319-325. 3 tables. [16 refs.]

II. Terhedebrügge, H. (1936). Trennung des Pocken- vom Maul- und Klauenseuche-Virus durch Ultrafiltration und Realkalisierung. [**Separation of Pox and Foot and Mouth Disease Virus by Ultrafiltration and Realkaliaztion**].—*Inaug. Diss., Hanover.* pp. 18. Numerous tables. [14 refs.]

I. This paper describes the separation of the virus of foot and mouth disease from that of vaccinia by three methods :– (a) by ultrafiltration through a membrane of pore size 230 mμ, according to Elford's method ; (b) by utilizing the discovery that vaccinia virus will grow in alkaline solution, in which that of foot and mouth disease is immediately killed, so that the viruses may beseparated by gradually increasing the alkalinity of the culture media, and (c) by growing the viruses on the chorion allantois of g. pigs, since the virus of vaccinia will grow quickly on this medium and that of foot and mouth does not grow at all. The above contentions are supported by much experimental detail. The authors carefully point out that although the separation of the two viruses from artificial mixtures can be satisfactorily carried out it cannot be assumed that a mixture due to a natural infection could be separated as easily by these methods.

II. This paper, being written in the form of a thesis, contains more details of technique than I (above) and deserves careful perusal from that point of view. For example T. draws special attention to the adsorption of the foot and mouth virus on the filter material and the necessity of care in ensuring that the membrane capillaries do not become blocked since misleading negative results might be obtained.—James Stewart.

Waldmann, O. (1937). La méthode de culture des virus avec considération spéciale du virus de la fièvre aptheuse. [**Virus Cultivation with Special Reference to Foot and Mouth Disease**].—*Bull. Off. internat. Epiz.* **14.** 191-208. 5 figs, 1 table. Discussion pp. 439-446.

A review of methods of virus tissue culture applicable to the growth of F. & M. virus. These include :- (1) tissue culture in a hanging drop of Tyrode solution, (2) culture in flasks such as the Carrel flask, and (3) culture in the chorio-allantoic membrane of chick embryos.

Virus must be subcultured several times before the maximum growth rate is attained, and, thereafter, fluctuations in the growth rate occur from time to time. Absolute specificity of the virus strain is maintained in culture. Virus from tissue culture in which g. pig tissue is used maintains much the same virulence for bovines as does similar virus passaged through living g. pigs.

In vaccine production, tissue culture in the future will be of immense importance, allowing of the rapid and cheap preparation of large amounts of fairly standardized virus.—E. J. Pullinger.

Hours, L. E. (1937). Cólera porcino. Vacuna contra el cólera del cerdo sin el uso del suero. Consideraciones generales, ensayos, conclusiones. [**Vaccination against Swine Fever**].—*Rev. Med. vet., B. Aires.* **19.** 155-167 and 226-237. 4 tables.

H. gives the results of trials with various vaccines against swine fever, carried out between 1931 and 1934. [The vaccines are not described in detail ; they were prepared at his own private laboratory].—S. Torres.

Remlinger, P., & Bailly, J. (1937). Action de la dilution sur les virus rabiques du rue. [**Effect of Dilution on Street Rabies Virus**].—*Ann. Inst. Pasteur.* **58.** 377-387. 11 tables. [1 ref.]

The effect of the dilution of street rabies virus has been examined in 11 different strains and conflicting results have been obtained. The titre of the virus by rabbit inoculation varied from 1 : 2,000 to 1 : 100,000. The important factor in the estimation of the virulence of the virus in relation to its dilution is the minimal amount of virulent nervous tissue inoculated ; this varied from 0·005 mg. to 0·5 mg. Repeated passage of the fixed virus may increase the concentration of the virulent material per unit weight of nervous tissue, the titre remaining at a high level. A fixed virus may be diluted to 1 : 900,000 without loss of virulence. Street rabies virus would rarely be diluted to any considerable extent in natural circumstances. Therefore, its destruction by dilution is of little practical importance with regard to the spread of the disease.—E. C. Hulse.

Scheunert, A., & Petzold, R. (1937). Untersuchungen über Beziehungen der Hundestaupe zu Vitaminmängeln. [**Connexion between Dog Distemper and Avitaminosis**].—*Tierernährung.* **9.** 147-172. [Numerous refs.] [English summary].

The nervous form of dog distemper is accompanied by symptoms similar to

those observed in B_1 and A avitaminoses. A review of the literature affords some evidence of a relationship between the two conditions, but no thorough investigation has been carried out.

As a source of vitamins the authors used irradiated brewer's yeast rich in vitamins B_1, B_2 and D. Two bitches were given irradiated yeast during the last few days of pregnancy and until the puppies were weaned. It was found, however, impossible to infect the puppies with distemper, whether they had received a supplement of irradiated yeast following weaning or not. This failure may have been due to a loss of virulence of the infected blood before inoculation.

A number of young dogs given supplements of yeast over periods of several months did not develop an immunity to infection with distemper virus. A complete diet, administration of irradiated yeast or pure vitamin B_1 had no effect on the course of distemper infection ; cod liver oil was also without effect. It is concluded that acute dog distemper is not related to vitamin deficiency.—E. G. White.

Hjärre, A., & Berthelsen, H. (1937). **Method for Fixing Neutral-red in Supravital Stained Blood Smears. [Diagnosis of Equine Infectious Anaemia].** —*Nature, Lond.* **140.** 155. [2 refs.]

For the purpose of examining blood smears of horses affected with equine infectious anaemia, the authors recommend the following method :– neutral-red is mixed in a test tube with citrated blood at body temperature in the ratio of 1 : 15,000. The test-tube is placed in a thermostat at 37°C. for 40 minutes, being shaken up a couple of times. Next a cover-glass smear is made, allowed to dry in the air for 24 hours, fixed with saturated picric acid solution, and then stained with Mayer's haemalin (Mayer's original recipe without citric acid), and embedded in cedar oil.

In the blood of normal horses granules of neutral red are deposited in the monocytes, eosinophiles and basophiles, but not in the neutrophiles or lymphocytes. In horses with E.I.A. (during a febrile attack) the dye is also to be found in the neutrophiles ; this result is of diagnostic importance.

Gram staining methods do not distinguish between large lymphocytes and small monocytes.—J. E.

Marcato, A. (1937). Le lesioni anatomo-isto-patologiche dell'anemia infettiva degli asini in Eritrea. [**Lesions in Infectious Anaemia of Donkeys in Eritrea**].—*Azione vet.* **6.** 144-145.

The following are the chief changes seen in donkeys dying from infectious anaemia :– malnutrition, subcutaneous oedema, pale visible mucous membranes with petechial haemorrhages, pale and haemorrhagic peritoneum, oedematous stomach and intestinal walls ; fatty degeneration of the liver with small whitish nodules between the lobules. In some cases there appears to be bile stasis, in others, infiltration of bile which is always accompanied by dilatation of the bile ducts and blood vessels. The kidney parenchyma is always pale and degenerated and the capsule can be stripped off easily and shows haemorrhages. Nephritis occurs. The urine contains bile pigments. Hypertrophy of the spleen is not a constant finding, but is often present. Fluid collects in the serous cavities. The histological picture is consistent with an irritation of the reticulo-endothelial system. There is a marked phagocytosis in the liver.—J. A. Nicholson.

Beaudette, F. R. (1937). **Infectious Laryngotracheitis.**—*Poult. Sci.* **16.** 103-105.

In this general paper B. stresses the pitfalls in clinical diagnosis of the disease, in that gasping occurs in other diseases and that atypical cases simulate other

conditions. Experimental inoculations (subcut., intramusc. and intraven.) fail to set up the disease, and from this evidence it is thought unlikely that an insect vector is concerned in transmission. The danger of recovered birds becoming carriers is mentioned.

B. recommends vaccination by inoculation in the cloaca, the respiratory symptoms thus being avoided. Vaccination is preferable to isolation and culling. Vaccinated birds are only infectious for about 10 days, whereas isolation and culling invariably spread the disease as many of the healthy birds which are sold are carriers.—D. L. Hughes.

Gins, A. (1936). Nachtrag zum referat über die Beziehungen der Schafpocken zu der Vaccine und der Variola. [**Relation of Sheep Pox to Vaccinia and Variola**].—*3rd int. Congr. comp. Path. 1936.* **2.** 431-432. [In German].

Gins, H. A., & Kunert, H. (1937). Weitere Erfahrungen mit der Kuhpocken-Schutzimpfung bei Schafen. [**Vaccination against Sheep Pox with Cow Pox Virus**].—*Dtsch. tierärztl. Wschr.* **45.** 257-263. 2 figs., 1 table. [15 refs.]

The authors were able to produce a strong immunity against sheep pox in sheep by vaccinating them with a highly virulent strain of cow pox virus. [Only a few sheep were used in the experiment but the results were sufficiently promising to justify repetition on a larger scale]. Sheep pox virus grown on the chorio-allantoic membrane of eggs whilst losing its pathogenicity for sheep also lost its immunizing power and was thus useless for vaccine preparation. The vaccination of sheep with virulent cow pox virus resulted in no serious reaction.—E. J. P.

Brandly, C. A. (1937). **Studies on Certain Filtrable Viruses. I. Factors Concerned with the Egg Propagation of Fowl-Pox and Infectious Laryngo-tracheitis.**—*J. Amer. vet. med. Ass.* **90.** 479-487. 2 tables. [15 refs.]

B. considers that the susceptibility of the tissues of the developing egg to artificial infection with viruses is not solely due to their undifferentiated structure. Thus it was found that the virus of infectious laryngotracheitis readily infected chicken and turkey eggs but did not "take" in duck, guinea fowl and pigeon eggs. It was also found that a greater concentration of fowl pox virus was necessary to infect duck eggs than chicken eggs. The length of time the eggs had been incubated also influenced their susceptibility to infection.

Another factor investigated was the adsorption of the virus on the material (quartz sand) used for triturating virus-containing tissues. It is suggested that tissues with a low virus concentration may give negative results due to this factor, even without subsequent filtration.

The effect of continued egg passage was found to be related to the length of incubation within the egg. If virus was harvested within three days of inoculation no significant alterations were noted, but when the virus was harvested on the sixth and seventh days the virus began to show a reduction in potency.

—D. L. Hughes.

I. Kidd, J. G., & Parsons, R. J. (1936). **Tissue Affinity of Shope Papilloma Virus.**—*Proc. Soc. exp. Biol., N.Y.* **35.** 438-441. [6 refs.]

II. Kidd, J. G. (1937). **A Complement-Fixation Reaction Involving the Rabbit Papilloma Virus (Shope).**—*Ibid.* 612-614. [6 refs.]

III. McKinley, E. B., & Acree, Ellen G. (1937). **Experimental Fever Therapy in Myxomatosis and Fibroma of Rabbits.**—*Ibid.* **36.** 414-416. [3 refs.]

IV. van Rooyen, C. E. (1937). **Elementary (Paschen) Bodies in Infectious Myxomatosis of the Rabbit (Virus myxomatosum Sanarelli).**—*Zlb. Bakt. I. (Orig.).* **139.** 130-137. 5 figs. [15 refs.] [In English].

I. Working with the Shope papilloma virus the authors record the specificity of its action in that it affects only the epidermis of rabbits and hares. The normal epithelium of the oral cavity, conjunctiva and urogenital tract, epithelium keratinizing as a result of avitaminosis A, embryonic epidermis, and the epithelium of the mammary gland which was proliferating as a result of Sharlach R stimulation, all proved to be insusceptible to the action of virus.

II. K. reports a complement-fixation reaction with extracts or filtrates of papillomas containing infective Shope virus and antisera effective against the latter. The technique used was essentially that described for viruses by Bedson and Bland [*Brit. J. exp. Path.* (1929). **10.** 393]. The sera of 15 domestic and 5 wild cottontail rabbits bearing Shope virus papillomas were found to bind complement in the presence of antigen, whereas the sera of 9 normal rabbits gave no fixation when tested concurrently.

Comparative tests of the virus-neutralizing and complement-fixing properties of the sera of rabbits bearing Shope papillomas were made and it was found that these properties ran in parallel.

The complement-fixing powers of the antigens used were found to be roughly proportional to their infective titres.

III. By employing a diathermy apparatus tests were made to determine the effect of induced fever on the development of myxomatosis and fibroma in rabbits. The tests were carried out on rabbits in various stages of the disease including animals with tumours of clinical proportions. Even in animals where fever therapy was commenced immediately after the injection of the viruses it was found to be valueless and contrast is made with certain bacterial infections where fever therapy has been found to be efficacious.

IV. van R. records the presence of typical elementary bodies occurring extracellularly in the conjunctival exudate of rabbits which had been infected with myxoma virus. They appeared in large groups in the proximity of ruptured cells, and also in pairs or in chains of four or five and were also observed within intact epithelial cells. On account of their very close resemblance to the elementary or Paschen bodies of vaccinia, comparative morphological studies and an elaborate series of experiments to confirm the purity of the strain of myxoma virus used, were made. The size of these stained elementary bodies varied from 0·31 to 0·36μ when measured by direct micrometry and by the extinction method.—D. R. W.

Parsons, R. J., & Kidd, J. G. (1936). **A Virus Causing Oral Papillomatosis in Rabbits.**—*Proc. Soc. exp. Biol., N.Y.* **35.** 441-443.

The authors record the occurrence of oral papillomatosis in rabbits – a condition which they have found to result from the activities of a virus. The papillomas were found only on the oral mucous membrane and usually on the under surface of the tongue; they were discrete, sessile or pedunculated, filiform or fungiform projections and were epitheliomatous in structure. Suspensions and also Berkefeld filtrates prepared from fresh or glycerinated papillomas regularly proved capable of causing the disease on inoculation into the under surface of the tongue of normal rabbits. It is recorded that the agent causing the papillomas showed a remarkable tissue affinity and was incapable of producing papillomas on the mucous membrane of the nose, conjunctiva, genitals, or the skin of the lip and abdomen. Other than the rabbit, no animal was found to be susceptible. Immunological studies did not reveal any relationship to the Shope papilloma virus.—D. R. Wilson.

Haagen, E. (1937). Virusmorphologie und Entstehung von Einschlusskörperchen. [**Virus Morphology and Inclusion Bodies**].—*Zlb. Bakt. I. (Ref.).* **125.** 489-496. 1 table.

Viruses can be classified into four groups according to their morphology (whether or not the elementary bodies can be rendered visible) and according to whether they produce inclusion bodies within the cells of the infected organism.

Sizes of elementary bodies are given in a table. The viruses range in size from those of rickettsia and psittacosis, the elementary bodies of which can be seen and stained, down to those of F. & M. disease and poliomyelitis in which neither is as yet possible. The staining of elementary bodies, particularly by using Victoria blue, and other methods of demonstrating them are discussed. The opinion is expressed that these structures are different from inclusion bodies. The name " inclusion body " is unsuitable as it suggests the enclosure within the cell of material brought in from without.

After classifying the virus diseases according to the situation of the inclusion body within the cell, H. gives an account of work carried out in conjunction with two Japanese investigators of the development of inclusion bodies in tissue culture. Vaccinia and herpes virus were used and a variety of staining methods designed to differentiate intracellular virus from cell inclusions. It is concluded that cell inclusions arise by the extrusion from the nucleus of a portion of its substance which gives a positive Feulgen reaction (test for thymonucleic acid). This reaction is not given by elementary bodies.

Although cell inclusions may contain virus, they may develop within the cell quite independently of its presence, *e.g.* intranuclear inclusion bodies may be found in the ganglion cells in herpes encephalitis in the rabbit as early as seven hours after infection and reach their maximum development in twenty-four hours : this does not correspond with the time for maximal multiplication of the virus.

—E. G. White.

PARASITES IN RELATION TO DISEASE (ARTHROPODS).

I. Symes, C. B. (1935). **Outline of Work on *G. palpalis* in Kenya.**—*E. Afr. med. J.* **12.** 263-281. 1 table, 1 map. [17 refs.]

II. Symes, C. B., & Vane, R. T. (1937). **The Eradication of G. palpalis from River Areas by the " Block " Method.** pp. 61. 16 plates, 20 tables, 5 charts, 3 maps, 5 appendixes. [5 refs.] Nairobi : Govt. Printer. [8vo].

III. Symes, C. B., & Vane, R. T. (1937). **The Eradication of Glossina palpalis from River Areas by the " Block " Method.**—*E. Afr. med. J.* **14.** 35-41. 2 figs. on 1 plate. [6 refs.]

IV. Henkel, J. S. (1937). **Report on the Plant and Animal Ecology of the Hluhluwe Game Reserve, with Special Reference to Tsetse Flies.** pp. 35. 17 figs. on 13 plates, 11 tables, 1 map. [Numerous refs.] Pietermaritzburg : The Natal Witness, Ltd. [fcp].

V. Lewis, E. A. (1937). **Tsetse-Flies in the Ol Orokuti Area of the Masai Reserve, Kenya Colony.**—*Bull. ent. Res.* **28.** 395-402. 1 fig. [12 refs.]

I. A survey of work which is reported in II.

II. The authors describe a successful experiment during 1933-35 on eradication of *G. palpalis* from the marginal fringes of bush along the Kuja river and its tributaries, Nyanza Province, Kenya. The method adopted was to divide the bush into blocks by transverse clearings, and to eliminate the resulting isolated populations of *G. palpalis* in these blocks. *G. brevipalpis*, which was also present, was not affected by these measures. The infected bush area is used by the natives for obtaining water supplies and is intersected by traffic routes. As the bush is essential grazing ground for cattle and goats, and for supplies of wood for fuel and hut-building, its complete clearance was ruled out.

Pupae collection was found to be uneconomical and was discontinued. Trapping was effective in reducing the initial density, but when the population had been reduced to a low level, hand catching was the only method effective in final elimination.

Seven clearings, varying in width from 200 to 1,050 yards were made. Four of the resulting isolated blocks, containing over 12 miles of river, were subjected to intensive eradication measures. On 11 miles of river, an area of about nine square miles of riverine bush has been cleared of *G. palpalis*, and the fly population in the remaining three square miles has been reduced by 93%. Voluntary settlement is proceeding in six square miles of this reclaimed area.

Detailed costs of the operations are given. Elimination of fly from isolated blocks costs about £40 per mile, as against a cost of £250 per square mile for complete clearance of bush.

Some incidental observations on the bionomics of the fly are given, and on the effect of flooding on the efficacy of clearance barriers. Meteorological records for the later period of experiment are included.

III. A précis of the above.

IV. H. carried out a survey of the Hluhluwe game reserve in Zululand with reference to the influence of environment on tsetse flies. The topography, climate, and plant and animal communities are described. The area is regarded as primeval, man's influence having been negligible, and the animal communities the result of natural balance. It is one of the few places in Zululand where tsetse flies still persist. The study is, therefore, held to be of value in that it shows the true relationship between the tsetse and its environment.

Two species, *G. pallidipes* and *G. brevipalpis*, both of which transmit nagana, occur over the whole reserve, but their true breeding places are limited to certain low lying areas. The probable influence of climate and vegetation on breeding places is discussed in the light of the survey results, and methods are suggested for eliminating the fly by rendering conditions in these limited areas unfavourable. The methods include clearance of ground cover, such as low shrubs, from among the trees, pruning of the lower branches of trees to increase ventilation and light, and dressing the soil with common salt, which should kill many puparia by osmotic effect or by unfavourable soil pH conditions, and make the physical condition of the soil unfavourable for survival and emergence.

V. The proposed settlement of native tribes in the Chepalungu forest area between the European settlement in Sotik and the uninhabited Ol Orokuti area of the Masai Reserve to the west aroused the fear that the native cattle might attract tsetse flies, which were believed to be extending eastwards in the Reserve, and so spread trypanosomiasis infection to the Sotik district. An investigation of the flies in the Reserve showed that no tsetse occurred in the Chepalungu forest itself, or in the eastern area of the Ol Orokuti district. A fly belt extending roughly north-west and south-east was discovered further west, infested by *G. palpalis* and *G. fuscipleuris*.

Observations on the habits of the second species are recorded, and it is suggested that it may transmit nagana.—J. MacLeod.

Swynnerton, C. F. M. (1936). **The Tsetse Flies of East Africa. First Study of their Ecology, with a View to their Control.**—*Trans. R. ent. Soc. Lond.* **84.** pp. 579. 22 plates, 7 maps, 10 appendixes. London: Royal Entomological Society. [8vo] [£5 10s.]

A detailed and comprehensive account of the present position of tsetse control in Tanganyika, and of the research work during 1931-34 on the ecology of six

species of *Glossina* capable of transmitting trypanosomiasis either of man or animals. The methods used in ecological research and in control work are fully discussed, and the value of aerial surveys in the planning of control measures is stressed. The plant associations of the territory are described in detail in relation to the distribution and needs of the flies, and the fact that each species needs for its survival a concurrence of two or more vegetation types is considered an important factor for control.

Poor results were obtained by biological control methods. Trapping did not effect the complete extermination which is usually necessary. Promising results are reported from the use of discriminative clearing methods, *i.e.* from change of the normal balance of elements in plant communities, rather than complete clearance of bush. It is stated that a width of at least two miles is necessary for a fly barrier clearing to be effective, and that odd remaining trees, and the presence of man or animals, may interfere with the effectiveness of such clearings. Evergreen thickets were found to form good barriers against spread of *G. morsitans*.—J. MacLeod.

I. Lloyd, L. (1936). **Assessment of a Tsetse Population.**—*Bull. ent. Res.* **27.** 261-267. 1 fig., 4 tables. [5 refs.]

II. Nash, T. A. M. (1936). **The Relationship Between the Maximum Temperature and the Seasonal Longevity of** *Glossina submorsitans*, **Newst., and** *G. tachinoides*, **Westw., in Northern Nigeria.**—*Ibid.* 273-279. 2 figs., 1 table. [8 refs.]

III. Buxton, P. A., & Mellanby, K. (1936). **Studies on Soils in Relation to the Biology of** *Glossina submorsitans* **and** *G. tachinoides* **in the North of Nigeria.**—*Ibid.* 281-287. 1 fig., 2 tables. [3 refs.]

IV. Nash, T. A. M. (1936). **The Part Played by Microclimates in Enabling** *Glossina submorsitans* **and** *G. tachinoides* **to Withstand the High Temperatures of a West African Dry Season.**—*Ibid.* 339-345. 9 figs. on 2 plates, 2 tables. [1 ref.]

V. Jack, R. W., & Williams, W. L. (1937). **The Effect of Temperature on the Reaction of** *Glossina morsitans*, **Westw. to Light. A Preliminary Note.**—*Ibid.* **28.** 499-503. 3 figs. [2 refs.]

I. L. studied the population of *G. tachinoides* in an isolated secondary focus, the "fly" density of which dwindled markedly each year during the dry season, by marking with distinctive colours known numbers of captured flies for 13 successive weeks. The proportions of each released batch occurring in subsequent captures were used to calculate the absolute population, which is held to have fallen from 6,000 at the start of the dry season (end of Oct.) to 400 in mid-January. The average survival of individual flies was under 6 weeks. It is held that the captures per boy-hour are only proportional to fly density when they are in the order of 50 or less.

II. Parallel experiments in Nigeria with flies kept in outdoor cages under climatic conditions simulating those of thicket, and with marked flies liberated and recaptured in the forest, indicated that the variations in seasonal longevity of *G. submorsitans* and *G.t.* are closely correlated with the maximum temperature, the highest average longevity occurring in the cold season. The female of both species was found to have a slightly longer life than the male. It is suggested that $2\frac{1}{2}$ months for *G.s.* and 3 months for *G.t.* represents the normal limits of longevity of individuals in nature in favourable weather, while in unfavourable hot weather one month is the probable limit for both species.

III. B. records data on the organic content and water-holding power of soils from thicket country in Nigeria which suggest that the pore space in the soil

may be almost saturated although a very low humidity is recorded for the air above it. Further, the water content may be reduced to 4%, and the soil appear to be quite dry, yet the soil air may be 90% saturated. He suggests that this may be an explanation of the survival of puparia of *G.s.* and *G.t.*, which are able to survive the dry season in Nigeria, although laboratory studies have shown that they require relatively high humidity. M. describes in an appendix a simple method of estimating the humidity in soils.

IV. The critical temperature limit for survival of *G.s.* and *G.t.* was found by experiment to be approximately 102°F. This limit was frequently or occasionally exceeded during the hot season in Nigeria in all types of shelter frequented by the fly except on the ground in the true forest. In the late dry season even this type of site closely approached the critical temperature. N. suggests that removal of peripheral thicket might allow the ground temperatures in the true forest to exceed the critical maximum, and thus tsetse might be controlled without sacrificing the valuable timber trees.

V. Laboratory experiments on the reaction of *G. morsitans* to light showed that the normal positive tropism is reversed when the temperature approaches 100°F., and the fly seeks the dark, irrespective of whether the temperature there is higher or lower than that in the light. It is suggested that this negative reaction may be the explanation of the shade-frequenting habit of the flies, and their reduced tendency to attack man during the heat of the day, in the late dry season in S. Rhodesia, where shade temperatures may exceed 100°F.—J. MacLeod.

Sugimoto, M. (1936). **Ticks and the Part they play in the Transmission of Diseases.**—*J. Taihoku Soc. Agric. For.* **1.** 245-250. [In Japanese.] [Copied *verbatim* from *Rev. appl. Ent.* **25.** 80].

A general account is given of the bionomics of ticks and of some of the diseases of domestic animals of which they are the vectors. In Formosa, piroplasmosis of cattle is transmitted by *Boophilus* (*Margaropus*) *annulatus microplus*, Can. (*australis*, Fuller).

Waterston, J. (1936). [Revised by P. A. Buxton]. **Fleas as a Menace to Man and Domestic Animals. Their Life-History, Habits and Control.**—*Econ. Ser. Brit. Mus.* No. 3. pp. 20. 6 figs. [2 refs.] [3rd Edit.]

This pamphlet comprises a short description of the structure, life-history and habits of the order *Siphonaptera* (fleas). There follows a summary of the methods for their control and eradication.—N. J. Scorgie.

Miller, D., Clark, A. F., & Dumbleton, L. J. (1936). **Biological Control of Noxious Insects and Weeds in New Zealand.**—*N.Z. J. Sci. Tech.* **18.** 579-593.

The paper is divided into five sections. That of veterinary interest is section V, dealing with animal pests.

The sheep maggot-fly, *Calliphora stygia*, has been parasitized by *Alysia manducator*, but no survey has been made to find the extent of control exerted by the parasite.—C. S. M. Hopkirk.

PARASITES IN RELATION TO DISEASE (HELMINTHS).

Skriabine, K. I., & Schulz, R. E. (1937). La lutte contre les principales helminthoses des chevaux. [**The Campaign Against the Principal Helminthiases**

of Horses].—*Bull. Off. internat. Epiz.* **14.** 286-317. Discussion pp. 467-468. 3 tables. [1 ref.]

As it is recognized that the promiscuous treatment of individual animals will not lessen the incidence of helminthiases, a planned campaign, adaptable to the variations of different localities, has been inaugurated in the U.S.S.R., and is to be intensified and extended over a wide area. The nature of the organization and plan of campaign are indicated in general terms. Mass therapeutic prophylaxis, sanitation of stables and the changing of pasturage at intervals of a few days are the most important points stressed. An appeal is made to other countries to undertake similar organized systematic action.

The following parasites are discussed individually so far as knowledge concerning them can be brought to bear on the problem of their eradication, especially from the U.S.S.R. :- *Parascaris equorum*, *Oxyuris equi*, *Dictyocaulus arnfeldi* (with which 30% of horses are said to be infested and which may cause death in 7 days to 2 months), the Strongylidae, *Parafilaria multipapillosa*, parasites of the genus Onchocerca, and *Strongyloides westeri*.—G. Williamson.

Dräger, W. (1936). 10 Jahre Echinokokkenbekämpfung in Neuvorpommern. [**10 Years' Campaign against Echinococcosis in and around Pomerania**]. —*Z. InfektKr. Haustiere.* **50.** 3-17. 8 tables. [Numerous refs.]

Ten years ago Neuvorpommern had the highest incidence of echinococcosis of all German territory, the cases of infection, according to meat inspection statistics, being 25% in cattle, 17% in sheep and 12% in pigs. By improvements in meat inspection work, largely brought about by lay meat inspectors at private slaughterings, by public demonstrations and by systematic worm treatment of dogs in contact with affected farm animals, it has been possible to reduce the percentage of affected animals to 6·5, 5 and 1·5 respectively.—J. E.

I. Magath, T. B. (1937). **Hydatid (Echinococcus) Disease in Canada and the United States.**—*Amer. J. Hyg.* **25.** 107-134. 2 figs., 12 tables. [Numerous refs.]

II. Dévé, F. (1937). L'échinococcose alvéolaire chez l'homme et chez les animaux. L'échinococcose alvéolaire humaine en France. [**Alveolar Echinococcosis in Man and Animals**].—*Rev. Path. Comp.* **37.** 453-472. 1 map. [Numerous refs.]

III. Cauchemez, L. (1937). L'échinococcose multiloculaire des animaux. [**Multilocular Echinococcosis in Animals**].—*Ibid.* 475-486. [12 refs.]

IV. Turner, E. L., Dennis, E. W., & Berberian, D. A. (1937). **The Production of Artificial Immunity against Hydatid Disease in Sheep.**—*J. Parasit.* **23.** 43-61. 16 figs. on 4 plates, 1 table. [Numerous refs.]

V. Dennis, E. W. (1937). **A Stable Concentrated Purified Antigen for the Immunological Study of Hydatid Disease.**—*Ibid.* 62-67. [12 refs.]

I. In America the usual hosts of the parasite are not the dog and sheep, but wild carnivora and wild herbivora; swine being the most commonly affected of domestic animals. The disease is rare in dogs and man.

II. The history of the disease and its geographical distribution are given. It is pointed out that the vast majority of cases in France occur near the Swiss border. The difficulty in diagnosis is noted and the aetiology discussed. Dévé suggests that the condition observed is due to a mutant form of *Taenia echinococcus*.

III. The proportion of animals slaughtered and found to be infected with echinococcosis varies greatly with the district. In Bulgaria it may reach 90% in cattle. It is rare in pigs and sheep. The lesions are described and differ from

those in man. C. thinks that in animals the multilocular cyst is formed by the development of a single hydatid cyst.

IV. Using a 1% suspension of dried and powdered scolices the authors injected intramuscularly a number of specially bred lambs from 1 to 3 weeks old. They gave a total amount of from 3-7 c.c. in a series of injections and from 21 to 170 days later infected the animals with 500 to 1,000 onchospheres by stomach tube. Approximately one year later the sheep were tested by the Casoni test and then killed. Variations in such factors as the viability of the onchospheres used in the infective dose and the pH of the alimentary tracts of the host were controlled in the case of 39 immunized and 12 control animals and the results, though irregular, showed that, while no absolute immunity was conferred, the cysts in the immunized animals were not only fewer in number and much smaller than in the controls, but were also calcified and the parasite was dead.

V. Cysts from cattle and sheep were aspirated and the bacterially sterile fluid precipitated with trichloracetic acid. The precipitate was washed, dissolved in sodium hydroxide, reprecipitated with glacial acetic acid and dried. This antigen, dissolved in saline to a concentration of 1 : 10,000 is suitable for specific precipitin, complement-fixation and Casoni tests.—P. S. Watts.

Granouillit, F. (1936). Contribution à la biologie de Cysticercus tenuicollis (Rudolphi) des foies porcins en Cochinchine. [*Cysticercus tenuicollis* **in Livers of Swine in Cochin-China**].—*Rev. vét., Toulouse.* **88.** 516-518. [1 ref.]

This records some *in vivo* observations of *C. tenuicollis* in pigs' livers, the object being the elucidation of the function of Glisson's capsule of the liver of the host in limiting migration. The observations concern more particularly the effect of movements of the parasite induced by changes of temperature after death and the survival period of the parasite after the death of the host. G. considers that the capsule enclosing liver lesions of *C. tenuicollis* probably develops as a result of the movement of the scolex and not as a barrier to toxin absorption.
—C. Davenport.

Roberts, F. H. S. (1936-1937). **Studies on the Biology and Control of the Large Roundworm of Fowls** *Ascaridia galli* **(Schrank 1788) Freeborn 1923.**—*Qd agric. J.* **46.** 38-50, 173-191, 328-356, 468-479, 586-601, 729-746, and **47.** 8-16. 21 figs. on 7 plates, 34 tables, 11 graphs. [Numerous refs.] [Reprinted as *Bull. Anim. Hlth Sta., Dep. Agric., Qd.* No. 2. pp. 106].

Examination of 579 fowls in the Brisbane area showed 42·1% to be infested with *A.g.* The fertile and infertile eggs are described and differentiated from the eggs of *Heterakis gallinae*. Eggs of *Ascaridia* may occur in both intestinal and caecal faeces, while eggs of *Heterakis* are usually passed in caecal faeces only. Caecal faecal matter is brown and pultaceous, while that from the intestines is usually formed and contains coarse particles. Eggs of both genera are thick shelled, oval with a small opercular plug at one pole. The egg of *Heterakis* (70μ × 39μ) is more rounded at either end with its sides less convex than those of *Ascaridia* (81μ × 52μ).

The optimum temperature for egg development is 33°C. Fresh eggs may withstand temperatures as low as −7·5°C. to −3°C. for about 17 days. Temperatures higher than 33°C. are eventually fatal. Eggs exposed in a liquid medium did not survive in sunlight for more than 3 hours. Eggs in fresh, normal-sized faeces allowed to dry out, were killed in sunlight after 14 days. The presence of moisture increased longevity to 28 days. Similarly eggs situated in shade survived 37 days.

Fresh and embryonated infective eggs dried on glass slides in shade survived 25 but not 30 days.

A boiling 5% aqueous solution of a disinfectant with a high tar-acid content was effective in destroying eggs. Eggs in tap water at laboratory temperatures survived up to 368 days. Eggs in faeces exposed to natural conditions of rainfall etc. survived 249 days in shade and 103 days in sunlight.

Under optimum conditions eggs become infective in 8 days. The infective stage is the second stage larva, the first moult having occurred in the egg in about 7 days. Infective eggs hatch in the small intestine and young larvae are most frequent a few cm. below the entrance of the bile duct. In the first nine days the larvae live freely in the lumen, from the 10th-19th day they attack the mucosa and feed on the epithelium. A few larvae may burrow deeply and may penetrate the intestinal wall to occur subsequently in the liver, lungs etc. After the 19th day the larvae again live free in the lumen. Three moults occur during the parasitic life-cycle at 5, 12 and 18 days after the ingestion of eggs. Maturity is reached after a minimum period of 27 days.

Experiments demonstrated the pathogenic importance of the parasite; lesions and symptoms are described. Macroscopic lesions are most prominent in the small intestine, liver and kidneys. Intestinal lesions include minute haemorrhages, larger and more deeply situated haemorrhages, areas of congestion, distinct loss of muscle tone, and, in chronic cases, marked thickening of the wall. In acute cases loss of muscle tone is very marked and is usually accompanied by an enlarged, flabby heart, with fluid present in the pericardial sac and peritoneal cavity. Heavy infestations may produce severe enteritis. The earliest symptoms may appear within a week of contact with infective material and include impaired appetite, decreased activity and abnormal thirst. Diarrhoea, anaemia and ruffling of the feathers follow. Leg weakness develops and may manifest itself by sudden onset of " leg paralysis ".

Age-resistance experiments indicated that if birds could be reared under worm-free conditions till about four months of age, they could then be turned on to infested soil with little subsequent ill effect. Among old birds there is both a resistance to infestation and to the effect of infestation.

Both individual and flock treatment trials were carried out on an extensive scale. For individual treatment it was found that carbon tetrachloride was very effective in dose rates of 0·75 ml. per 1 lb. live weight, with a maximum dose of 2 ml. Starvation overnight is necessary for high efficiency, but no after-starvation period is required. The most economical method of administration is by means of syringe and rubber tubing, though higher efficiency was obtained when the drug was given in capsules.

For flock treatment nicotine sulphate mixed with the mash at the rate of 0·5 ml. in 150 ml. water per pound of mash, and fed for a period of 7 days proved very effective (82·5%) against *A. galli* and fairly effective (54·5%) against *H. gallinae*.

Measures to prevent infestation are given and the advantages of the intensive system for the application of such measures are discussed. The original should be consulted for details of control and prophylactic measures and of extensive field trials dealing with treatment.—H. McL. Gordon.

Paz Arriaga, E. (1936). Filariosis cardio-pulmonar. [**Cardio-Pulmonary Filariasis in a Dog in Colombia**].—*Rev. Med. vet., Bogotá.* **7.** 162-163.

Description of one case of cardio-pulmonary filariasis in a dog. The parasite was not classified.—S. Torres.

IMMUNITY.

Steinbach, M. M., & Klein, S. J. (1936). **Effect of Crystalline Vitamin C (Ascorbic Acid) on Tolerance to Tuberculin.**—*Proc. Soc. exp. Biol., N.Y.* **35.** 151-154. [7 refs.]

Experiments are recorded which indicate that the daily injection of crystalline vitamin C increases the tolerance of tuberculous g. pigs to repeated large doses of tuberculin. In most of the experiments vitamin C treated g. pigs survived doses of old tuberculin ranging from 50 to 1,000 mg., whilst untreated controls died. Vitamin C had no inactivating effect on tuberculin when mixed *in vitro* prior to injection into g. pigs.—N. J. Scorgie.

Ågren, E., & Hasselgren, H. (1937). Fall av akut tuberkulinförgiftning. [**Two Cases of Acute Tuberculin Poisoning in Man**].—*Svensk VetTidskr.* **42.** 148-150.

When performing the tuberculin test on a calf, A. accidentally got the needle inserted into his own thumb and most of the tuberculin (0·1 c.c.) was injected. During the course of the day the finger swelled to two to three times its normal size and he was confined to bed for several days with a temperature of 40°C. Later an abscess developed at the site of the prick. The finger healed after about three weeks.

H. reports a similar accident. The illness was mild.

—Gustav Naerland (Oslo).

Schmidt, O. (1937.) Ein kasuistischer Beitrag zur Bewertung der Phymatin-Augenprobe. [**The Phymatin Eye Test for Bovine Tuberculosis**].—*Tierärztl. Rdsch.* **43.** 197-199. [10 refs.]

S. finds that the ophthalmic test for the diagnosis of bovine TB. is best judged 12 hours after the instillation of phymatin and that the reaction persists for 40 hours.

—S. J. Edwards.

Schellner, H. (1937). Ueber die Bruzellinaugenprobe bei bruzellose-verdächtigen Pferden. [**Conjunctival, Intradermo-Palpebral and Subcutaneous Intradermo-Palpebral Tests with Brucellin in Horses**].—*Tierärztl. Rdsch.* **43.** 449-451. 1 fig. [10 refs.]

Intradermo-palpebral allergic tests may be used for the diagnosis of brucella infection in horses. The technique for preparing the abortin and for carrying out the test is described. A positive reaction consists of a local swelling which begins to develop within two hours of inoculation, reaches its maximum in about six hours and subsides in the course of the next few hours. Swellings persisting for 24 hours may be considered non-specific. In addition to swelling there is some sero-purulent discharge from the conjunctiva. There may also be some febrile response.—E. J. Pullinger.

I. Nitti, F., Bovet, D., & Depierre, F. (1937). Les phénomènes allergiques provoqués par certaines amines aromatiques. [**Allergic Phenomena Caused by Certain Aromatic Amines**].—*Rev. Immunol.* **3.** 376-386. 1 fig., 5 tables. [5 refs.]

II. Dujarric de la Rivière, R., & Kossovitch, N. (1937). Pouvoir antigénique spécifique des divers isomères d'une même substance. [**Specific Antigenic Power of Different Isomers of the Same Substance**].—*Ibid.* 405-412. 3 tables. [2 refs.]

I. An investigation of the types of di-amino groupings which stimulate allergic sensitivity and those which fail to do so. Also a study has been made of the extent to which the spatial arrangement of atoms can be altered in a molecule without altering the allergic specificity.

II. The various stereo-isomers of leucin and histidine are absolutely specific as regards their ability to stimulate allergic response in a sensitized animal. [Stereo-isomers are compounds of which the chemical constitution differs only in the spatial arrangement of atoms within the molecules].—E. J. Pullinger.

Trawiński, A. (1937). Serologiczna metoda rozpoznawania wagrzycy i włośnicy świn. [**Serological Diagnosis of Cysticercosis and Trichinosis**].—*Hig. Prod. Zwier.* **2.** 1-5. Suppl. to *Wiad. weteryn.* **16.**

The technique of the precipitation test for cysticercosis and for trichinosis in pigs is described. The antigen is prepared from scolices of cysticerci and from extracts of trichinae respectively and the antigens are used with serum or meat extract from the animal to be tested. The reaction is said to be reliable and it can be carried out with live or dead animals. The antigens and test material are mixed (0·5 c.c. of each) and are placed in an incubator for 30 minutes, after which they are ready to be read.—A. Szwabowicz (Lwów).

I. Weiland, P. (1936). Die Serodiagnose der Tuberkulose im Meerschweinchenserum und ihre Bedeutung für die tierexperimentelle Tuberkuloseforschung. [**Serodiagnosis of Tuberculosis in Guinea Pigs**].—*Z. Immun-Forsch.* **88.** 104-116.

II. Stock, H. (1936). Beiträge zum serodiagnostischen Nachweis der Rindertuberkulose. [**Serodiagnosis of Bovine Tuberculosis**].—*Inaug. Diss., Leipzig.* pp. 30. 10 tables. [Numerous refs.]

I. The possibility of making an early diagnosis of TB. in g. pigs by the use of the complement-fixation or Meinicke-Klärung reactions is considered. It was found that g. pigs produce antibodies against this infection slowly and that a month is too short a period to allow for the formation of a measureable amount of antibody as in many cases a longer interval is necessary. [A month is usually long enough for the development of easily observable lesions of TB.]. The relationship between the resistance of the g. pig to TB. (as judged by the extent of the tissue reaction) and the degree of serological response is discussed.

II. Samples of blood from 173 bovines were subjected to various modified forms of the complement-fixation test (using different types of antigen), and to modified flocculation reactions. With one exception all types of test gave some false negative results. In the case of the Paarmann technique [*V. B.* **4.** 526.], however, there were no false negative results as judged by subsequent P.M. findings, but this particular technique was only used upon a few samples.—E. J. Pullinger.

Colomo de la Villa, G. (1936). Reacciones serológicas en el diagnóstico de las brucelosis animales. [**Serological Diagnosis of Brucella Infections**].—*Trab. Inst. Biol. anim. Madr.* **4.** 253-292. 14 tables, 3 graphs. [Num. refs.]

The rapid slide and the tube aggl. tests and the c.f. test were carried out on the sera of 86 cattle and 34 sheep or goats. C. considers that the rapid aggl. test is too sensitive and that it should only be used as an indicator. He concludes that the c.f. test is more sensitive in acute and chronic cases than the tube aggl. test, but that both methods should be used to establish a diagnosis.

Three rams were inoculated with an antigen of several strains of brucella. One received living organisms, another dead, and the third living organisms plus

saponin. Intradermal tests were carried out on all three rams at intervals of 48 hours. The aggl. and c.f. tests were carried out over a period of 38 days (when sheep pox broke out).

The graphs show that the agglutination titres descended when the complement-fixation titres rose. C. repeated these experiments on another lot omitting the intradermal tests and obtained the same result.—A. H. Hunter.

Strazberger, S. (1937). Wpływ szczepionki B.C.G. na tworzenie sie aglutynin anti-brucella abortus. [**Influence of BCG on the Production of Brucella Agglutinins**].—*Wiad. weteryn.* **16.** 217-221. 3 tables. [5 refs.] [French summary].

From tests on g. pigs and rabbits which were injected (subcut.) with 20 mg. of BCG and two to four weeks later with 0·5 c.c. of a suspension of *Br. abortus*, S. concludes that BCG has no influence on the formation of anti-brucella agglutinins.—A. Szwabowicz (Lwów).

Sievert, Lena. (1936). Untersuchungen über den Antigenaufbau in der Brucellagruppe. [**Brucella Antigens**].—*Z. ImmunForsch.* **89.** 249-259. 9 tables. [8 refs.]

Using smooth but old stock strains of brucella, S. confirmed and elaborated the findings of Wilson and Miles on the antigenic structure of the *Brucella* genus. She stresses the need for careful quantitative absorption in the preparation of monospecific antisera, as in certain cases it is easy to absorb out all brucella antibodies. S. claims to have been able to absorb all antibodies from *melitensis* antiserum, using either the bovine or porcine strains of *Br. abortus* antigen, whilst *melitensis* antigen failed to absorb all antibodies from antiserum against the other two.—E. J. Pullinger.

I. Huddleson, I. F. (1937). **A Slow-Drying Antigen for the Brucella Rapid Agglutination Test.**—*J. Amer. vet. med. Ass.* **90.** 519-520. [1 ref.]

II. Lee, A. M., & Turner, M. E. (1937). **A Comparison of the Tube and Plate Methods of Testing for Bang's Disease in Elk.**—*Ibid.* 637-640. 3 tables. [2 refs.]

I. H. describes a method of preparing a *Br. abortus* antigen which does not undergo rapid drying. By adding a suitable proportion of glycerin to a standard antigen a suspension can be obtained in which the agglutinated particles of antigen remain very distinct even after the mixture with serum has dried completely.

II. The authors tested the blood sera of 145 elk by the tube and rapid tests. They found that 19% reacted and that the tube test with a 72-hour incubation and a polyvalent antigen was considerably more accurate than the plate or rapid test. —S. J. Edwards.

I. Stover, D. E. (1937). **A Composite Drop-Reaction Sheet for the Spot Method of Conducting the Whole Blood Test for Pullorum Disease.**—*J. Amer. vet. med. Ass.* **90.** 661-664. 1 fig. [2 refs.]

II. Hamilton, H. P. (1937). **Large Scale Testing of Fowl's Blood for the Presence of *S. pullorum* Infection.**—*Vet. J.* **93.** 175-178. 1 table.

I. S. describes a new spot aggl. test for whole blood. A rectangular sheet of Whatmen filter paper No. 120 is ruled into $\frac{3}{4}$ inch squares with a free $\frac{1}{2}$ inch border. A piece of thin, even-textured lens paper is pasted at its corners to the filter paper. Stained *Salmonella pullorum* antigen, as used for the conventional whole-blood test method, is mixed in the proportion of 100 c.c. to 3 c.c. of a

20% solution of potassium oxalate. Single drops of this antigen are placed in small tubes immediately before the test. A drop of blood from each bird is then placed in each tube which is quickly rotated to prevent coagulation. The mixture is allowed to interact for 6-8 mins. (in a small incubation chamber in cool weather), and the tube is then gently inclined to one side several times to hasten positive reactions. Finally a drop of each mixture is withdrawn by a straight-tipped pipette and placed on the lens paper over the middle of a square.

The test is easily read through the formation of spots of three distinct types, which are illustrated. It has the advantage that the largish clumps of bacteria are enmeshed in the lens paper and that they are, therefore, separated from single bacteria and blood cells, these latter being rapidly drawn through to the filter paper by the capillarity of the air space between the two papers. This causes a more distinct reaction which may be filed for future reference. The method overcomes the drawback of coagulation of blood and of rapid evaporation of blood-antigen mixtures.

II. H. details his technique for the single tube aggl. test with a serum dilution of 1 : 25 of an antigen made from a mixture of 20 strains of *S.p.* These are grown on solid medium in Roux flasks, washed off with 2% phenol in saline solution and then standardized to tube No. 1 of the Wellcome scale with normal saline solution to which 2 drachms of N/1 NaOH per litre have been added (final strength of phenol about 0·25%). The test mixtures are incubated overnight at 98·4°F.

Monthly tests carried out in the years 1934 to 1936 inclusive and the average monthly percentage of reactors for the three-year period are tabulated and discussed.—C. V. Watkins.

Paille, R. (1937). La typhose aviaire et l'agglutination rapide au sang sec. [**Rapid Agglutination Test with Dry Blood for Fowl Typhoid**].—*Rev. Méd. vét., Toulouse.* **89.** 199-201. 3 figs. [6 refs.]

P. describes a new agglutination technique using dry blood and a stained antigen for the detection of carriers of fowl typhoid. A drop of blood is spread by an inoculation loop to form a ¾ inch diameter circle at one end of a glass slide, allowed to dry and then wrapped in tissue paper until required for test. The test should be made within one week.

To make the test a drop of distilled water is spread over the dried blood, the slide is gently rocked for 5 min. to aid solution of agglutinins and then, by inclining the slide and the use of a needle, the drop is guided to the other end of the slide, where it is mixed with a drop of stained antigen. A positive reaction occurs within 1 min.

The method obviates masking of the reaction by fibrin and red blood cells and is applicable to partially coagulated blood from a carcass. It also overcomes the disadvantage of rapid clotting of blood when carrying out the usual whole blood aggl. test.—C. V. Watkins.

Verdina, C. (1936). Sulla sierologia della tuberculosi. La reazione immunitaria di Meinicke (MKR tbc.). [**Meinicke's Clearing Reaction in the Diagnosis of Tuberculosis**].—*G. Batt. Immun.* **17.** 59-94. 3 figs. [Numerous refs.]

V. gives detailed instructions on the procedure to be followed in the preparation and use of the various antigens and sera employed. He reviews the results obtained by a large number of research workers in this field and concludes that Meinicke's clearing reaction, unless combined with other methods, does not lend itself to practical application for purely diagnostic purposes.—S. F. J. Hodgman.

I. Feldt, C. (1936). Die Meinickische Flockungsreaktion im Vergleich zur Agglutination und Komplementbindung zur Diagnose der Abortus-Bang-Infektion des Rindes. [**Comparison of Meinicke's Flocculation, Agglutination and Complement-Fixation Tests for Contagious Abortion**].—*Inaug. Diss., Leipzig.* pp. 33. 2 tables. [Numerous refs.]

II. Seelemann, M., & Green, W. (1937). Die Brauchbarkeit der Flockungsreaktion nach Meinicke für die serologische Ermittlung bangpositiver Milchproben. [**Diagnosis of Brucellosis by Meinicke's Reaction with Milk**].—*Tierärztl. Rdsch.* **43.** 386-387.

I. After reviewing the available literature F. presents the results of a study of the value of the aggl., complement-fixation and Meinicke flocculation tests for the diagnosis of *Br. abortus* infection carried out on 3,634 samples of bovine blood. The tests agreed uniformly in the case of 78% of the sera, 67% being negative and 11% being positive. A total of 1,000 samples showed positive results to one or other of the three tests. Of these 97·6% reacted to the flocculation test, 70% to the complement-fixation test and 54% to the aggl. test. The most satisfactory combination in diagnosis was obtained by applying the two former tests.

[The agglutination test was interpreted as being positive only when a definite reaction at the 1 : 100 serum dilution was present. It is, therefore, probable that the number of positive reactions was under-estimated].

II. By comparing the Meinicke flocculation and the aggl. tests for the detection of *Br. abortus* agglutinins in milk, the authors found that the two tests gave results which closely agreed. It was found essential to apply the flocculation test on freshly drawn samples free from abnormality.—S. J. Edwards.

Eagle, H. (1937). **On the Mutual Multivalence of Toxin and Antitoxin.**—*J. Immunol.* **32.** 119-127. 2 figs., 1 table. [9 refs.]

When toxin and antitoxin combine *in vitro* they only do so in a fixed proportion, and only form a neutral compound if the reagents are mixed in approximately optimal proportions. If excess of toxin is present, antitoxin binds several times more toxin than it can neutralize and the resulting combination is toxic. Similarly, in excess of antitoxin, the toxin is distributed sparsely amongst the antitoxin particles, none of which are entirely saturated.—E. J. Pullinger.

Mishulow, Lucy, Mowry, Isabelle, & Stocker, Anne K. (1937). **Potency of Typhoid and Paratyphoid Vaccines when Freshly Prepared and after Storage.**—*J. infect. Dis.* **60.** 356-363. 2 tables, 3 graphs. [8 refs.]

Typhoid and paratyphoid vaccines after storage for 2½-3 years at 8°-10°C. showed no demonstrable deterioration in their ability to stimulate agglutinins in rabbits. Protection experiments with mice similarly showed that vaccines stored for 1½-3 years were as potent as freshly prepared vaccines.—N. J. Scorgie.

Pagel, W. (1937). **Experiments on " Dissociation " of Allergic Hypersensitiveness and Immunity.**—*J. Path. Bact.* **44.** 643-659. 11 figs. on 3 plates, 5 tables, 4 charts. [Numerous refs.]

An attempt has been made to test the relationship which is often assumed to exist between hypersensitivity and resistance to a particular disease, the degree of allergy sometimes being considered to be a reliable index of immunity. G. pigs were vaccinated with killed cultures of tubercle bacilli suspended in different excipients, certain of these excipients being those which interfere with the production of allergic sensitivity. The resistance of the animals to subsequent adminis-

trations of virulent tubercle bacilli was, however, equally satisfactory whether they developed a strong allergic sensitivity or not. From the results of experiments of this type, it is concluded that hypersensitivity and immunity are dissociable phenomena.—E. J. PULLINGER.

GERBER, I. E. (1936). **Morphologic Aspects of the Local Shwartzman Phenomenon.** —*Arch Path.* **21.** 331-350. 4 figs. [15 refs.] [Copied *verbatim* from *Bull. Hyg., Lond.* **11.** 589. Signed W. W. C. TOPLEY].

The author has studied the morphological changes that are associated with the Shwartzman phenomenon at its various stages. He finds that the inflammatory action that follows the preparatory injection into the skin shows no specific characters and differs in no detectable way from that induced by other agents that do not sensitize the skin to subsequent intravenous injections. He would, therefore, support Shwartzman's conclusion that the preparatory factors induced a local sensitivity of the skin that is not in the nature of a simple trauma, of an increased permeability of the capillaries, or of an inflammatory change, but is probably due to some functional disturbance of the affected cells that requires a short induction period, and disappears rapidly.

CLAUDE, A., & DURAN-REYNALS, F. (1937). **Chemical Properties of the Purified Spreading Factor from Testicle.**—*J. exp. Med.* **65.** 661-670. 3 figs. on 1 plate, 3 tables. [16 refs.]

A factor having the property of enhancing infection and increasing tissue permeability had been shown by D.-R. to exist in testicle extracts [*V. B.* **2.** 166]. The chemical nature of this factor had not been discovered. In this paper a method for the preparation of the spreading factor is detailed. The chemical properties of this substance were studied and it was found to resemble a protein in character. In concentrated solution it produced a condition of the skin of the nature of an oedema.—JAMES STEWART.

I. SHWARTZMAN, G. (1936). **Phenomenon of Local Skin Reactivity to Bacterial Filtrates: Effect of Bacterial Filtrates Injected Intravascularly upon Reactions to Antigen + Antibody Complexes.**—*J. exp. Med.* **64.** 529-551. 6 tables. [Numerous refs.]

II. WITEBSKY, E., & NETER, E. (1936). **The Significance of Age of Rabbits for the Elicitation of the Shwartzman Phenomenon.**—*J. Immunol.* **30.** 471-475. 4 tables. [6 refs.]

I. If a rabbit is sensitized by a single intravenous injection of horse serum and six days later an intradermal injection of the same substance is given, the skin and subcutis at this site are altered. In consequence, if certain bacterial filtrates are administered (intraven.) within 24 hours of the intradermal injection, this filtrate localizes at the site of the intradermal injection, and produces an extensive haemorrhagic inflammatory reaction. The intensity of this local reaction depends upon the degree of skin preparation (*i.e.*, specific protein sensitization) rather than upon any variations of potency of the bacterial filtrate. Various methods of eliciting such local tissue reactivity, and possible explanations of the phenomenon, are also discussed.

II. It is noted that a comparatively high percentage of young rabbits are refractory to the Shwartzman phenomenon. When such animals mature a proportion of them become susceptible and in time give positive reactions. There is no definite age or stage of development at which the change occurs.—E. J. P.

HUDDLESON, I. F., & MUNGER, Myrtle. (1936). **Phagocytic Activity of Bone-Marrow Cells.**—*Proc. Soc. exp. Biol., N.Y.* **35.** 27-29.

The authors report that the bone-marrow cells from normal and immunized g. pigs show high phagocytic activity against *Brucella abortus* when tested *in vitro* in the presence of immune serum. Marrow cells from the peripheral blood of a case of myelogeneous leucaemia were equally active when tested in the presence of the patient's serum. Marrow cells from normal g. pigs in the presence of normal serum or leucaemic whole blood showed no phagocytic activity.—N. J. S.

I. KAEMPFFER, A. (1935). Die Blutgruppeneigenschaften der Pferde und ihre Vererbung. [**Blood Groups of Horses and their Inheritance**].—*Z. Züchт. B.* **32.** 169-191. 9 tables, 1 chart. [14 refs.]

II. SZYMANOWSKI, Z., & FRENDZEL, J. (1936). Ueber Immunisoantikörper im Schweineserum. [**Blood Group Antibodies in Pig Serum**].—*Z. Immun-Forsch.* **88.** 397-402. 4 tables. [1 ref.]

I. It has been previously established that there exist in the horse six red blood corpuscle receptors and six serum agglutinins. Of the 486 blood groups which might theoretically exist, 188 have until now been demonstrated in a survey of 1,000 horses. The distribution of the various groups and the application of LANDSTEINER'S rule are discussed. Formerly, the receptors and agglutinins in horse blood were A and B and α and β respectively; the four recently discovered factors are now designated as C, D, E, F, and γ, δ, ϵ, and ϕ. Either A or B was found in 75-90% of the animals examined, the other factors being found in 20-30% only. In a study of 400 horses, it was found that the corpuscular factors are inherited; it is considered possible that the agglutinins α and β are also inherited.

II. Group specific iso-agglutinins were found in high titre in swine fever antisera prepared in pigs injected with group A blood. It is suggested that this may find application in forensic medicine for the detection of persons in group A. —E. G. WHITE.

DISEASES, GENERAL.

JURASKE. (1936). Die Registratur des Veterinärbeamten. [**A Standard Registration Scheme for the Recording of Animal Diseases**].—*Berl. tierärztl. Wschr.* **52.** 733-735.

J. gives his system of classifying the work done by district veterinarians in Germany. The object is to have a uniform scheme from which conclusions of comparable value can be drawn. A simple decimal system is used, ten primary figures being applied to the chief fields of work, *e.g.*, infectious diseases, meat inspection, etc., secondary figures being used for details.—J. E.

ANON. (1937). I problemi zootecnici sanitari nell' A.O.I. [**Animal Husbandry and Diseases in Italian East Africa – Eritrea, Italian Somaliland and Abyssinia**].—*Clin. vet., Milano.* **60.** 164-167.

The most important disease in Italian East Africa is rinderpest. To reduce the losses, veterinary surgeons have been instructed to watch with care all cattle in their districts, paying particular attention to those areas where large numbers of cattle congregate and may remain unseen for months. Should the disease appear, the affected area must be closed to the entrance or exit of cattle belonging to other tribes, and the water supply must be examined, and kept only for the affected animals. Prophylactic treatment must be given as soon as possible to all cattle

in the neighbourhood and the field officer must report the outbreak to the institute in his area.—J. A. Nicholson.

Robscheit-Robbins, F. S., & Whipple, G. H. (1936). **Infection and Intoxication. Their Influence upon Hemoglobin Production in Experimental Anaemia.**—*J. exp. Med.* **63.** 767-787. 8 tables. [11 refs.]

Working with dogs suffering from an artificial anaemia produced by bleeding, it was noted that a dog suffering from pyorrhoea and two bitches suffering from endometritis were unable to replace the haemoglobin lost by bleeding until these infections had been removed by operation. In view of this observation turpentine was injected (subcut.) into other dogs, and it was found that while the resultant local inflammatory reaction was present, the production of haemoglobin was inhibited. Feeding with liver, or the administration of thyroid or sodium dinitrophenol, at this stage did not augment the production of haemoglobin.—H. H. H.

Anon. (1936). **Report of the Special Committee on Poultry Diseases. [Amer. Vet. Med. Ass.]**—*J. Amer. vet. med. Ass.* **89.** 449-450.

Attention was called to the rising mortality rate in young pullets, not due to infectious disease and occurring in spite of all measures for the control of infectious and parasitic disease. The importance of further research in genetics in this connexion is emphasized. Bacillary white diarrhoea is still a common disease in chicks and has been observed in turkeys. More information on nutritional diseases is desirable. Attempts are being made to standardize methods of diagnosis and also to establish a system of collecting references to publications on poultry diseases. The Committee suggests that the term "infectious bronchitis" should be applied to the disease described by Shalk and Hawn [(1931). *J. Amer. vet. med. Ass.* **78.** 413.] and shown to be immunologically distinct from infectious laryngotracheitis.—C. McGaughey.

Sniečkienė, P. (1936). Vištu apsinuodijimas gyvenančiomis srutose musiu lervomis. [**Poisoning of Fowls by Fly Larvae (Lucilia, Erystalis)**].—*Vet. ir Zootech., Kovno.* **13.** 307-312. 1 fig. [6 refs.] [German summary].

Poisoning of 90 out of 120 chickens, with the larvae of *Lucilia* and *Erystalis* is described. The larvae were found in liquid manure. Within 3 days 38 birds died, the mortality being higher among the younger birds.

Symptoms observed were:—listlessness, blue comb, distension of the crop and thirst. Appetite was maintained throughout. P.M., the crop was extended and impacted with food, and there was catarrh of the mucous membranes of the crop and intestines, hyperaemia of the liver and distension of the gall-bladder.—A. W. Möller.

Wyssmann, E. (1937). Zur Frage des bösartigen Katarrhalfiebers. [**Malignant Bovine Catarrh**].—*Schweiz. Arch. Tierheilk.* **79.** 101-121. [Num. refs.]

The assumption that sheep act as carriers of bovine malignant catarrh often does not hold good as both outbreaks and sporadic cases frequently occur without there having been contact with sheep. The incubation period is unknown. The influence of hygiene, diet, weather and season on the incidence of the disease is discussed, but little is known about these points.—G. Hartmann (Vienna).

Colyer, F. (1936). **Variations and Diseases of the Teeth of Animals.** pp. 750. 1,007 figs. London: John Bale, Sons and Danielsson. [4to] [42s.]

C. has made an extensive study of the teeth of mammals, obtaining a large

part of his material from natural history museums of the European continent and America. The book is devoted chiefly to variations in number, shape and position of teeth, but covers also injuries and diseases. The domestic animals are dealt with in their due zoological position and numerous cases of veterinary interest are given, together with excellent illustrations.—J. E.

Heizer, E. E., & Hervey, M. C. (1937). **Impacted Molars – a New Lethal in Cattle.**—*J. Hered.* **28.** 123-128. 4 figs. [Copied *verbatim* from *Anim. Breed. Abstr.* **5.** 136].

More than half the paper consists of a review of the incidence of lethal factors in cattle. The condition of impacted molars was observed in a herd of closely inbred Milking Shorthorn. The mandibles are greatly reduced in length and width, giving a " parrot-mouth " appearance. The space occupied by the premolars is markedly reduced and the teeth themselves grow at different angles. The analgen of the molars also are abnormal in size and position. No other defects of the teeth or other parts were present. The five affected calves died within a week. Their pedigree is consistent with the view that the defect is a monogenic recessive.

Eisele, F. (1936). Angeborene Haarlosigkeit bei Kälbern der schwarzbunten Niederungszucht als Auswirkung eines Letalfaktors. [**Congenital Alopecia in Calves**].—*Züchtungskunde.* **11.** 432-437. [3 refs.]

During the summer of 1934, five completely hairless still-born calves were reported in a single herd. The same bull had served each of the cows. No previous record of total congenital alopecia was found in the German literature. By tracing the pedigrees of the cows and the bull sufficiently far back, a bull was found common to both. This animal had been brought into Sweden in 1902 and has recently been shown to have carried the factor for complete alopecia (hypotrichosis congenita): this resulted in very considerable loss among Swedish herds. From the breeding history it is concluded that a combination of a recessive lethal factor, together with a recessive hypotrichosis congenita factor, accounted for the occurrence of both still birth and alopecia. Continued inbreeding renders possible such a combination of recessive factors, and the introduction of new blood is indicated to prevent its recurrence.—E. G. White.

Roemmele, O. (1935). Das Zungenschlagen der Rinder – ein Erbfehler. Untersuchungen und Heilungsversuche über dieses Leiden. [**" Tongue-Shaking " in Cattle, an Inherited Fault**].—*Süddtsch. landw. Tierz.* **28.** 339-341. [Abst. from abst. in *Berl. tierärztl. Wschr.* **52.** 204].

This vice, which has not been reported in Great Britain, occurs in Germany exclusively in mountain cattle and begins to appear in 4-6 week-old calves. Investigations designed to find out whether the condition is associated with qualitative malnutrition yielded negative results, but some evidence of its heritability was obtained. Various types of apparatus for preventing " tongue-shaking " are used.—J. E.

Cordier, G., & Ménager, M. J. (1937). Fièvre bilieuse hémoglobinurique des bovidés en Tunisie. [**Bovine Haemoglobinuria in Tunisia**].—*Rec. Méd. vét. exot.* **10.** 61-71. [3 refs.]

The authors describe a condition occurring in a herd of cattle of which the most typical symptom was haemoglobinuria. A number of cattle were affected at the same time. These facts and other symptoms observed suggested a *Babesia* infection, but examination of the blood and other organs failed to reveal the

presence of any causal protozoan. Other possible causes – alimentary intoxication, *Bilharzia* infestation, bacterial infection, etc., were considered, but the aetiology was not ascertained. Treatment with drugs considered to be specific for piroplasmosis was without beneficial effect.—N. J. Scorgie.

Pullar, E. M., & Lerew, W. M. (1937). **Vulvovaginitis of Swine.**—*Aust. vet. J.* **13.** 28-31. [1 ref.]

Particulars are given of the occurrence of this disease among pigs on a farm in Victoria. The herd comprised 80 head and all females except the brood sows were affected. The labiae vulvae were swollen and oedematous, the mucous membrane was congested and there was a thin catarrhal exudate. Exposure of two healthy female pigs to an affected one, coupled with introduction of vaginal exudate from the affected sow into the vulvae of the two experimental pigs failed to transmit the disease.

P.M. examination of an affected animal revealed no lesions apart from those of the vulva, and these extended only to the urinary meatus. It transpired that the pigs on the farm were being fed largely on home-grown maize cobs which had become heavily infected with mould. Only pigs that were fed on this maize were affected, the first cases appearing shortly after its use was commenced. The lesions rapidly regressed when the feeding of mouldy maize was discontinued. Only females were affected, there being no symptoms in male pigs fed on the same ration, and the condition developed in some females so soon after their birth as to suggest that a toxic principle from the mouldy maize was excreted through the mammary glands of affected sows. The authors consider the disease they describe to be similar to that encountered in Iowa in 1928 by McNutt, Purwen, and Murray [*J. Amer. vet. med. Ass.* **73.** 484-492].—D. A. Gill.

Hug, A. (1937). Ueber chronische Atembeschwerden des Pferdes. [**Chronic Lung Disease in the Horse**].—*Schweiz. Arch. Tierheilk.* **79.** 251-280. 5 figs. on 5 plates, 1 table. [Numerous refs.]

Statistics of livestock insurance companies in Switzerland show that during a period of five years compensation was paid for 1,334 out of 88,367 insured horses on account of broken wind. These cases represented 25% of all horse losses. Greater losses occurred in farm horses than in Army horses. Most of the horses rendered useless by respiratory diseases were between 11 and 12 years old and the majority had been imported. H. examined the lungs of 38 horses killed on account of broken wind and in all cases he found bronchitis and emphysema, affecting mostly the apical lobes.

From a review of the literature and from his experiences H. concludes that the main cause of this respiratory trouble is faulty acclimatization, faulty training for work, bad stabling and the feeding of dusty and mouldy fodder.

It was found that the greatest number of cases of lung disease in horses followed bad hay seasons. Heavy ("Kaltblut") horses were more often affected than lighter horses.—F. Freudenberg (Berlin).

Thorp, F., Jr. (1936). **A Bacteriological Study of the Aerobic Flora occurring in Pneumonic Lungs of Swine.**—*Thesis, Urbana, Illinois.* pp. 5.

The lungs from 204 pigs were used in this study. Two media were used for primary isolation, liver infusion blood agar and lactic acid glucose agar, the latter to detect budding fungi. Thirty-eight of the 204 lungs were apparently normal: from one of these a streptococcus similar to that found in the remaining affected lungs was obtained. Forty-seven of the pneumonic lungs yielded no growth.

The micro-organisms isolated were in the following order of frequency :– streptococci, pasteurella, *Alcaligenes*, diplococci and one staphylococcus. No budding fungi were obtained in primary culture.—D. L. Hughes.

Derzelle, E. (1937). La méningite cérébro-spinale chez le veau. [**Cerebro-spinal Meningitis in a Calf**].—*Ann. Méd. vét.* **82.** 258-264. 2 figs.

Bact. coli and *Salmonella paratyphi* [type not stated] were isolated from the cerebrospinal fluid of an 11-day-old calf which had exhibited signs of cerebrospinal meningitis since birth. The symptoms are described in detail.—G. Williamson.

Wester. (1937). Kehlkopflähmung bei Pferden. Hemiplegia Laryngis. Recurrenslähmung. [**Roaring in Horses**].—*Arch. wiss. prakt. Tierheilk.* **71.** 381-411.

The commonest cause of degeneration of the recurrent nerve is strangles accompanied by suppuration of the retropharyngeal lymph nodes. Damage to the nerves also follows influenza, lead poisoning, lathyrus poisoning and dourine. In many cases the recurrent laryngeal nerve was examined histologically and signs of degeneration were found only in the peripheral part. The left nerve was more frequently involved because it lies nearer the lymphatic vessels. No hereditary disposition was found.—F. Freudenberg (Berlin).

Liebsch, E. (1937). Zur klinischen Symptomatik der allgemeinen Lähme des Rindes und ein Beitrag zur Paresolyt-Therapie. [**Treatment of Paralytic Conditions in Cattle**].—*Berl. tierärztl. Wschr.* March 26th. 193-198. 3 graphs.

It was found that out of 93 milking cows suffering from general paralysis, coma, or tetany during the past 6 years, 29 animals had calved and 31 had been moved by road or rail a short time before the onset of illness. Thirty-three of the affected animals had not previously calved or been moved. In all cases the cows were valuable milk-producers which had never before been ill. Treatment with "paresolyt" produced good results in cases of paralysis after calving or transport, but not in cases of paralysis before calving or transport.—G. Hartmann (Vienna).

Ellis, N. R., Croft, W. A., & Zeller, J. H. (1936). **A Preliminary Study of Variations in Free-Choice Intake of the Components of a Standard Ration and Breeding as Possible Factors in the Occurrence of Lameness in Pigs.** —*Proc. Amer. Soc. Anim. Prod.* December. pp. 77-81.

Frequent cases of lameness (up to 20% of the litters farrowed in 1935) occurred among pigs on record-of-performance tests at Beltsville, Md. The free choice ration consisted of shelled yellow corn, a protein mixture and a mineral mixture. Comparison of the Ca and P intakes with the Ca and P values of the blood at slaughter, showed that there was a close relationship between low Ca intake and low Ca, but not all the groups showing a low mineral intake contained affected pigs. The high incidence of lameness among inbred pigs suggested a genetic factor together with an inherent defect in Ca assimilation, but further experiments on these questions are considered necessary before definite conclusions can be drawn. —R. Allcroft.

Noland, T. W. (1934). **Work with Fowl Paralysis at the Missouri Poultry Experiment Station, 1933.**—*Yearb. Mo. Poult. Exp. Sta. 1933.* pp. 12-13. [Copied *verbatim* from *Exp. Sta. Rec.* **72.** 109].

The results of the experiments conducted led to the belief that paralysis in

the fowl is only a symptom growing out of a combination of several direct causes ; (1) Worm infestation, (2) chronic coccidiosis, (3) the gizzard worm *C[heilospirura] hamulosa*, (4) incorrect feeding methods and diet, and (5) various tumours, many of which are malignant in nature. In 70 per cent. of the paralysis cases examined in the laboratory the gizzard worm was found embedded beneath the gizzard mucosa, resulting in an area of necrosis and ulcers and impaired digestion.

Pugh, L. P. (1937). **" Dry Distemper " in the Dog (" Infectious Brown Mouth " of Dogs).**—*Vet. Rec.* **49.** 757-761. Discussion pp. 1274-1279. [16 refs.]

P. describes a condition of dogs which he considers a separate entity from distemper (Laidlaw-Dunkin virus). He bases his conclusions particularly on the following points :– (1) the disease is seen in dogs that have been immunized against distemper ; (2) it is seen in animals which have previously had distemper, and (3) it has not been found possible, so far, to demonstrate the presence of the Laidlaw-Dunkin virus in the cases of the disease which he describes.

The condition is referred to as an acute, subacute or chronic febrile disease. The particular symptoms stressed are tonsilitis, furring of the teeth with a brown slimy deposit, diarrhoea, and, not infrequently, nervous derangments. A slight catarrh of the eyes and nose is usual, but is not so prominent as in distemper.

In the discussion Dalling gave the results of laboratory investigation of alleged breakdowns in distemper immunization and of examination of the cases referred to by P. Distemper virus was not found by ferret or complement-fixation tests. Spleen emulsion and blood from these cases caused a rise in temperature and symptoms simulating the laboratory type of distemper, when inoculated into puppies. The same result was obtained independently of whether the puppies had previously been immunized against distemper or not. It is suggested that the animals examined were affected with a virus condition other than distemper.

Bateman and others considered that there is not yet sufficient evidence for describing a condition other than distemper.—J. W. H. Holmes.

Drieux, H., & Mendoza, M. A. (1937). Les états précancéreux dans le testicule chez le taureau et le bélier. [**Precancerous Conditions of the Testicle of Bulls and Rams**].—*Bull. Acad. vét. Fr.* **10.** 242-255. 5 figs. [6 refs.]

This paper is one of a series dealing with the comparative pathology of neoplasms of the testicle. In the abattoirs of Paris the authors examined 7,840 testicles of bulls and 5,023 testicles from rams. Only two seminomas were found in the bull and none in the ram. In the former animal, conditions which are regarded as being precancerous were found and were classified as :– (1) foetal seminiferous adenoma (7 cases) – a benign condition associated with functional regression of the seminiferous tubules, not necessarily followed by malignancy ; (2) papilliferous adenoma (8 cases) – this is a true benign tumour peculiar to bovines which it is suggested might be transformed to a malignant seminoma if the animals were allowed to reach old age, and (3) transitional stage between (1) or (2) and a malignant seminoma (3 cases). Conclusive evidence of conversion into a seminoma must await the finding of both conditions in a single testicle.

The low incidence of testicular tumours in the bull and ram is attributed to the early age at which they are slaughtered.—E. G. White.

Braca, F. (1937). Comportamento del sistema reticolo endoteliale nella cauterizzazione. [**Behaviour of the Reticulo-Endothelial System after Burns**].—*Profilassi.* **10.** 54-61. 4 figs. [Numerous refs.]

Cauterization is always followed by a local reaction produced chiefly by the

cells of the reticulo-endothelial system. During the first few days of the exudative phase there are practically no R.E. cells at the site so treated and they do not become active until desquamation and repair have begun. Experimental cauterization of the skin, subcutaneous tissue or muscles showed that in cases where infection supervened, the reaction of the reticulo-endothelial system was intensified; for this reason B. considers that instead of being harmful, a secondary infection after the cauterization of wounds may have a beneficial effect.—J. A. Nicholson.

Landauer, W. (1937). **The Hatchability of Chicken Eggs as Influenced by Environment and Heredity.**—*Bull. Storrs agric. Exp. Sta.* No. 216. pp. 84. 21 figs., 57 tables. [Numerous refs.]

This bulletin presents not only the results of investigations into the problems of incubation and hatchability carried out over a period of more than 30 years at the Storrs Agricultural Experiment Station, but includes a critical survey of the whole field of this subject.

The various aspects are dealt with under the following headings :– the physical environment of hatching eggs, the chemical environment during incubation, egg traits which influence hatchability, nutritional factors in hatchability, age and reproductive activity of parent stock as factors in hatchability, metabolism of laying hens as a factor in hatchability, genetic factors affecting hatchability, and embryo development and hatchability.

The literature on this subject is reviewed in the text, and there are 11 pages of bibliography.—R. F. Gordon.

Watson, Marion. (1937). **Studies on the Influence of Diet on Resistance to Infection. I. The Effect of Various Diets on the Fertility, Growth, and Survival of Mice. II. The Effect of Various Diets on the Resistance of Mice to Bacterial Infections.**—*J. Hyg., Camb.* **37.** 396-419 and 420-444. 8 figs., 30 tables. [Numerous refs.]

I. This paper records experiments on the influence of various diets on reproduction and growth in mice. Diets containing oatmeal, bran, cod liver oil, and "yeastrel" with various modifications and additions, were found to vary widely in value. The best results, as judged by the fertility of the does, infrequency of litter-eating, and the growth and survival of young mice, were obtained with diets to which about 25% of dried separated milk was added. Diets consisting only of whole oats and milk, or diets in which the main source of protein was wheat gluten or caseinogen, were unsatisfactory as judged by the above standards. It was further found that zinc cages were unsuitable for housing the mice owing to the presence of some toxic substance (? lead) in the metal.

II. The second paper records the relative resistance of mice, bred and reared, or fed for short periods, on diets outlined in the previous publication, to *Salmonella typhi-murium*, or to a toxic substance isolated from that organism. It was found that in groups of young mice reared on a diet containing dried separated milk, dextrine or flour-and-water-biscuit, and coconut oil, the mortality rate was significantly lower than in groups of mice bred and reared on a diet from which these constituents were absent, when the mice were exposed to *per os* infection with *S. typhi-murium*, or to the injection (intraperit.) of its toxin. The author thinks it probable that the factor responsible for this increase in resistance is the dried separated milk.—N. J. Scorgie.

Emerique, Lise. (1937). Le rachitisme expérimental chez le cobaye. [**Experimental Rickets in G. Pigs**].—*C. R. Acad. Sci., Paris.* **205.** 879-882. 2 figs. [2 refs.]

G. pigs weighing 185-250 g., on Steenbock and Black's diet supplemented with 2 c.c. lemon juice and having a Ca : P ratio of 8·7 : 1, did not develop typical lesions of rickets even when their diet was supplemented with spinach providing extra vitamins and altering the Ca : P ratio to 5·3 : 1. Younger g. pigs weighing about 100 g. did not survive on the basal diet, but others given a supplement of spinach showed after 24 days true rachitic lesions which cleared after feeding irradiated ergosterol for seven days.—R. Allcroft.

Davies, G. O. (1936). **Osteodystrophia Fibrosa (Osteofibrosis) in Domesticated Animals.**—*Vet. Rec.* **48.** 1399-1404. [8 figs.]

D. describes six cases of osteodystrophia fibrosa. The series included a horse, pig, goats and dogs. In the case of the goats it was confused with actinomycosis and in the dogs with osteomalacia or "rubber jaw". The macroscopic and microscopic findings were the same in all and consisted of an osteoporosis followed by excessive deposition of fibro-cellular tissue. In horses the disease is due to too high a phosphorus-calcium ratio in the food, but no definite cause has been established in other animals.—P. S. Watts.

Barrat. (1937). Cachexie osseuse et drèches de brasserie. [**Osteodystrophia and Brewers' Grains**].—*Rev. Méd. vét., Toulouse.* **89.** 471-479.

The incidence of osteodystrophia in French dairy stock is discussed from a clinical point of view. The addition of calcium phosphate to the diet did not give entirely satisfactory results; the addition of beet pulp, with its low P content, aggravated the condition, but health was quickly restored when the cows were fed on brewers grains which, although devoid of the anti-rachitic factor, contain a fair quantity of phosphoric acid. The digestive organs were the first to respond. It is considered that the disease was due, not merely to a deficiency of available P and vitamin D, but also to impaired activity of the digestive tract caused by dry feeding in unhygienic stables.—G. Williamson.

I. Heller, V. G., & Penquite, R. (1937). **Factors Producing and Preventing Perosis in Chickens.**—*Poult. Sci.* **16.** 243-246. 1 table. [3 refs.]

II. Wilgus, H. S., Jr., Norris, L. C., & Heuser, G. F. (1937). **The Effect of Various Calcium and Phosphorus Salts on the Severity of Perosis.**—*Ibid.* 232-237. 5 tables. [10 refs.]

I. Ether, alcohol and water extracts were made from yellow corn, whole wheat, wheat bran, wheat embryo, rice bran and alfalfa and the effects investigated after their addition in the form of a drink to a basal ration which produced perosis in 76-100% of the chicks used. In no case was the condition aggravated by any of the corn extracts, but a water extract of rice bran prevented the occurrence of the condition and the growth of the chickens consuming this extract was increased, while they had also larger, smoother and better coloured legs than the controls. The addition of small amounts of manganese also prevented occurrence of perosis, although large amounts were detrimental to growth. Analysis of the rations for their manganese content supported the theory that this ion might be responsible for prevention.

II. Feeding experiments on day old Barred Plymouth Rock and Rhode Island Red × Barred Rock cross-bred chicks for a period of six weeks showed that the Ca : P ratio is of no particular significance in the incidence or severity of perosis, even when increased to 2·5 : 1 by the use of steamed bone meal. Pure calcium carbonate, hydroxide and chloride as well as pure mono-, di- and tri-calcium phosphate increased the severity of the disease to about the same extent

as did steamed bone meal when added to a basal ration low in the preventive factor. A technical grade of mono-calcium phosphate was found to possess a marked preventive action, but further experiments showed that this was not due to the form of the salt but to some unknown contaminating material. This series of experiments also confirms the aggravating effects of pure calcium carbonate and of phosphorus on the occurrence and severity of perosis.—R. ALLCROFT.

PATTON, A. R. (1937). **A Comparison of the Glycine Contents of the Proteins of Normal and Chondrodystrophic Chick Embryos at Different Stages of Development.**—*J. Nutrit.* **13.** 123-126.

Glycine was determined on 60 normal and 83 chondrodystrophic chick embryos. The results show that glycine is synthesized during development of the chick embryo, but that chondrodystrophic embryos contain less glycine than normal embryos. Whether the lack of glycine in chondrodystrophic chicks is a cause or a result of chondrodystrophia has not been established.—R. ALLCROFT.

SEGNA, B. (1937). L'azione del calcio sulla glicemia. [**Action of Calcium in Glycaemia**].—*Nuova Vet.* **15.** 246-252. 2 graphs.

Blood sugar determinations in dogs have shown that the intravenous injection of $CaCl_2$ is followed by a rise in the blood sugar titre. This rise begins about 10 minutes after the injection and reaches its maximum in about 30 minutes, after which the blood-sugar titre gradually returns to its previous level. Injections of sodium citrate have precisely the opposite effect. S. considers that Ca ions may have a direct action on the hepatic cells, stimulating them to turn out more glucose into the blood.—J. A. NICHOLSON.

ELVEHJEM, C. A., PHILLIPS, P. H., & HART, E. B. (1937). **Differentiation Between Vitamin B_4 Deficiency and " Encephalomalacia " in Growing Chicks.**—*Proc. Soc. exp. Biol., N.Y.* **36.** 129-131. 2 figs. [3 refs.]

Vitamin B_4 deficiency causes an early check in the growth of the bird while the encephalomalacia-like paralysis develops very rapidly, severe symptoms occurring in a few hours. After initial nervousness the animals affected with the latter condition show a tendency to sit on their hocks and at frequent intervals move backwards, pushing with their feet. When completely exhausted the animal will lie on its side still pushing with its feet, but will never exhibit the tendency to fall to one side or the other like those suffering from vitamin B_4 deficiency. The histology of the two diseases and studies on the properties and distribution in foodstuffs of the deficient factors responsible for the two conditions will appear in future papers.—R. ALLCROFT.

SALGUES, R. (1937). La laine du mouton ostéomalacique. [**The Wool of Sheep with Osteomalacia**].—*C. R. Acad. Sci., Paris.* **205.** 580-582.

The weights of fleeces from sheep with osteomalacia are about 50% less than those from normal sheep. A comparison of the chemical composition shows that there is a lowering of dry matter, protein and ash; the decrease in ash is due solely to a decrease in the P content of the wool of osteomalacic sheep, and the resultant increase of the $CaO : P_2O_5$ ratio is claimed to be particularly significant. —R. ALLCROFT.

KOFFMAN, M. (1937). Bidrag till kännedomen om acetonemi hos nötkreatur. [**Acetonaemia in Cattle**].—*Skand. VetTidskr.* **27.** 413-446. 8 tables. [8 refs.] [English summary].

This article gives the results of investigations on the aetiology of acetonaemia in cattle, especially with regard to its possible relationship to the pH reaction, and the quantitative and qualitative composition of the microfauna of the rumen. The report is preliminary, and the observations made are too few and the results obtained too diverse for any convincing conclusions to be drawn.—G. N. (Oslo).

Sjollema, B. (1936). Recente gegevens omtrent door gebrek aan vitaminen veroorzaakte dierziekten. [**Recent Work on Avitaminosis**].—*Tijdschr. Diergeneesk.* **63.** 1141-1153 and 1226-1240. [Numerous refs.] [English, French and German summaries].

S. surveys present day knowledge of vitamin A in connexion with diseases of the domestic animals. After briefly explaining the chemistry of provitamins, carotenes and vitamin A, he examines the amounts present in the most commonly used foodstuffs. In plants it is considered that the amount of carotene is proportionately parallel to that of chlorophyll. The richest source of vitamin A is halibut-liver-oil. The general symptoms of vitamin A deficiency are then discussed and some information is given of the following diseases of animals which are related to vitamin A deficiency :– in horses – hyperkeratosis (Finland) and abortion in mares in March (Scandinavia) ; in calves – unthriftiness, diarrhoea and blindness ; in milch cows – moon-blindness, ulceration of the cornea and anoestrus after calving ; in piglets – blindness, diarrhoea, loss of weight and sometimes convulsions ; in puppies – conjunctivitis, corneal opacity and xerophthalmia (North America) ; in young chickens – ataxia, spinal incoordination, xerophthalmia and unthriftiness.—A. W. Möller.

PUBLIC HEALTH.

Anon. (1937). Trasmissibilità dell'infezione brucellare all'uomo mediante i formaggi freschi e grassi. [**Transmissibility of Brucellosis to Man by Cheese**].—*Azione vet.* **6.** 258-260.

If milk is infected with *Brucella melitensis*, the process of extracting the cream causes the bacilli to adhere to the fat globules. Cheese is dangerous in proportion to its fat content, and infection can be carried to uncontaminated cheese by the leaves in which it is wrapped. Pasteurization of all milk used for cream, cheese or butter, is considered necessary.

For diagnosis of infection in animals from which milk is taken, Mirri's brucellin is strongly recommended.—S. F. J. Hodgman.

THERAPEUTICS.

Anon. (1936). **Report of the Permanent Commission on Biological Standardisation.**—*Quart. Bull. Hlth Org. L.o.N.* **5.** 571-745. 7 figs., numerous tables. [Numerous refs.]

The report provides an excellent review of the present position of biological standardization, of the various standards actually in use and of investigations now in progress for establishing additional standards. A large part is devoted to insulin and to a discussion of the new standard ; the testing of it in a number of centres by the rabbit and by the mouse method is described in detail and the reasons for fixing the unit at 1/22 of a mg. of the new standard are given. As the standard is now a pure crystalline substance it is anticipated that the value will be

a permanent one. A fresh supply of posterior pituitary powder prepared at the National Institute for Medical Research, London, has been adopted as a standard and one unit of anti-diuretic activity is defined as the anti-diuretic action exercised by 0·5 mg. of the powder. Owing to the withdrawal of Germany from the League of Nations, the National Institute has also undertaken the preparation, preservation and distribution of arsenobenzenes. A dry stable preparation of *Clostridium histolycum* antitoxin, and diphtheria antitoxin No. 788, both prepared by the State Serum Institute of Copenhagen, have been adopted as international standards. Further work is suggested on tetanus antitoxin, poliomyelitis convalescent serum, staphylococcus antitoxin, anti-typhoid serum and *Bact. coli* antitoxin. Among others, the international standards of the vitamins and of the sex hormones are described in the report by the Director of the Department of Biological Standards of the National Institute.—J. M. Robson.

Magara, M. (1937). Sur le rôle anti-toxi-infectieux de l'hormone sexuelle. [**Antitoxic and Anti-Infectious Properties of the Sex Hormones**].—*C. R. Soc. Biol. Paris.* **125.** 779-781. [1 ref.]

Oestrin protects female (but not male) g. pigs and mice against diphtheria toxin. Male hormone protects male (but not female) g. pigs against diphtheria toxin. Oestrin does not directly neutralize diphtheria toxin. Oestrin protects female (but not male) mice against tetanus toxin. Male hormone does not protect either male or female mice against tetanus toxins. In all experiments only some of the animals have been partially or completely protected.—J. M. Robson.

Anon. (1936). E. Merck's Jahresbericht über Neuerungen auf den Gebieten der Pharmakotherapie und Pharmazie. XLIX Jahrgang. [**Merck's Yearbook of New Work on Pharmacology and Therapeutics. Vol. 49**]. pp. 314. 10 figs., 10 tables. [Numerous refs.] Darmstadt: E. Merck. [8vo].

This contains two original articles on the pharmacology and use as a narcotic of "Vinethen" and seven on vitamins; also a review on the use of lentin in veterinary medicine. Lentin (carbaminoylcholinchloride) is a strong stimulant of the parasympathetic nervous system and has a wide field of use. It acts on smooth muscle and on the glands of the alimentary tract. Notes on numerous drugs are also given.—J. E.

Hobson, R. P. (1937). **Sheep Blow-fly Investigations. V. Chemotropic Tests Carried Out in 1936.**—*Ann. appl. Biol.* **24.** 627-631. 2 tables. [4 refs.]

H. describes a method for determining the repellent effect of different chemicals on the sheep blowfly, *Lucilia sericata*, giving the results of tests of a number of organic substances at concentrations of 0·1%, 0·3% and 0·9%. The natural oils, pennyroyal, clove and wintergreen, and the principal constituent of wintergreen, eugenol, were repellent at 0·3%. Eucalyptus oil, creosote and turpentine were among those not repellent at 0·9%. No tests were made of the duration of these repellent effects.

Further observations confirmed the previous finding [*V. B.* **7.** 280.] that sheep treated with indole or ammonium carbonate were rendered attractive only to *L. sericata*. It was also found that only gravid females of this species were attracted to the sheep.—J. MacLeod.

Brown, H. W. (1937). **Observations on the Mode of Action of Several Anthelmintics upon** *Ascaris lumbricoides* **(Pig Strain)**].—*Amer. J. Hyg.* **26.** 72-83. 3 tables. [9 refs.]

Ascaris will ingest various solutions *e.g.* normal saline and mineral oil, and also solutions of anthelmintics, *e.g.* carbon tetrachloride in mineral oil; they do not ingest mineral oil solutions of chenopodium even in great dilution. Certain anthelmintics (*e.g.* hexyl resorcinol, thymol, ascaridol) act more rapidly when *Ascaris* are immersed in solutions or suspensions of them than when such solutions are injected orally into the gastro-intestinal tract. It is concluded that the mode of action of these anthelmintics on *Ascaris* is through the cuticle rather than from penetration *via* the alimentary tract of the worm. Delayed death results when a small portion of a worm is injured by an anthelmintic applied locally.

—J. M. Robson.

Sitowski, L. (1937). Goździk ogrodowy jako środek leczniczy przeciw robakom kota. [**Treatment of Worm Parasites of Cats with Extract of Pinks** (*Dianthus sp.*)].—*Wiad. weteryn.* **16.** 227-228. [German summary].

S. observed that a cat which was infested with a *Taenia taneniaeformis* ate the leaves of a pink (*Dianthus caryophyllus*). As a result the cat vomited soon afterwards and thereby got rid of three specimens of the parasite and also one specimen of *Toxocara cati*. S. suggests that *D.c.* may be of some value as an anthelmintic.—A. Szwabowicz (Lwów).

Mori, N. (1937). Le isopatine nelle applicazioni pratiche. [**"Isopatin" Therapy in Veterinary Medicine**].—*Azione vet.* **6.** 412-419.

"Isopatin" is prepared directly from diseased tissues and is presumed to contain the bacterial products, etc., present in them. It is used as a prophylactic or curative agent and may be given by any of the usual routes. It is harmless to healthy animals. "Isopatin" prepared from carcinoma has had a beneficial effect on human patients suffering from cancer, and in some cases it is claimed that a complete cure has been effected. Sarcomata and epitheliomata in horses, cats and dogs have also been treated, apparently with success, by this method. Treatment with "isopatin" has reduced the mortality rate in goats affected with exudative pleuro-pneumonia, and several controlled experiments with horses suffering from glanders are said to indicate that it is of value in this disease also.

[Details of the preparation and dosage of "isopatin" are not given].—J. A. N.

Cuillé, J., Darraspen, E., & Florio, R. (1937). Le traitement de la piroplasmose du chien par un dérivé de l'urée, le "zothelone" (acaprine de Bayer). [**Treatment of Canine Piroplasmosis with Acaprin**].—*Rev. Méd. vét., Toulouse.* **89.** 161-165. [12 refs.]

Favourable results have been obtained, comparable to those given with trypan blue. The drug can be injected subcutaneously and no local reactions are produced. The dose is 1 c.c. of 0·5% solution diluted with 20 c.c. of "glucose serum" to avoid a general reaction. Occasionally a second dose is necessary. No serious toxic symptoms have been observed.—J. M. Robson.

Gousseff, W. F., & Parkhomtschik, W. P. (1937). Behandlung der Kaninchenkokzidiose mit Albargin und Protargol. [**Treatment of Rabbit Coccidiosis with "Albargin" and "Protargol"**].—*Munch. tierärztl. Wschr.* **88.** 292-293. 2 tables. [5 refs.]

"Albargin" and "protargol" were first administered in doses of 1-1·5 mg. and then in doses of 1-2 mg. to rabbits infected with coccidia. Such doses were found to suppress the development of rabbit coccidia and reduce the number of the oocysts. The substances appeared to have no toxic effect on the rabbits. On a

simultaneous stoppage of "albargin" and "protargol" treatment and cage disinfection, an increase in the oocyst output was observed.—C. HORTON-SMITH.

STEEVENSON, G. F. (1937). **Contagious Equine Pneumonia Treatment with Neosalvarsan.**—*J. R. Army vet. Cps.* **8.** 171-172.

"Neosalvarsan" was found to have a markedly beneficial effect on horses suffering from contagious equine pleuro-pneumonia. When given early it cut short the course of the disease and in all cases lessened the period of convalescence by more than one half.—G. WILLIAMSON.

KATHER, H. (1937). Pharmakologische und toxikologische Untersuchungen über Veratrinum Hydrochloricum. [**Pharmacology and Toxicology of Veratrine**].—*Inaug. Diss., Hanover.* pp. 34. 1 text fig., 16 figs. on 1 plate, 1 table. [Numerous refs.]

Experiments were carried out on dogs to ascertain the lethal dose of veratrine hydrochloride. K. concluded that the minimum lethal dose usually stated in the literature is much too high and that 0·3 mg. per kg. body weight was nearer the correct figure, although he found a large individual variation in susceptibility to it. A large number of experiments were carried out on the vagus and cerebrum including blood pressure and respiration measurements and from the data given it is shown that veratrine cannot be accepted as a very useful nerve stimulant. —JAMES STEWART.

LEA, D. E., HAINES, R. B., & COULSON, C. A. (1936). **The Mechanism of the Bactericidal Action of Radioactive Radiations. – I. Theoretical. II. Experimental, Alpha and Beta Particles.**—*Proc. roy. Soc.* Ser. B. **120.** 47-76. 9 figs., 5 tables. [14 refs.]

Possible alternative mechanisms of the bactericidal action of alpha and beta radiations are elaborated, based upon the known physical phenomena accompanying the passage of these radiations through matter. Possible means of distinguishing between these alternatives are discussed. The results of the authors incline towards the "target" hypothesis. A technique is described for the preparation of bacteria in thin gelatin films for exposure to corpuscular radiations of small penetrating power. Experiments are described in which *B. mesentericus* spores, *Bact. coli* and *Staph. aureus* are irradiated by alpha and beta particles. The fraction surviving is an exponentially diminishing function of the time of irradiation. The results are expressed in terms of mean ionization dosage required to produce death, and also by statement of the "target areas". The rate of disinfection is found to be independent of the temperature and for a given type of radiation to be proportional to the intensity of the radiation. No difference was observed between the effects of a divided exposure and a single exposure.—J. M. ROBSON.

JAENECKE, R. (1936). Beiträge zur Therapie der Gebärparese mit Untersuchungen des Blutkalkspiegels im Verlauf der Krankheit. [**The Treatment of Milk Fever, and Observations on the Blood Calcium in that Condition**].—*Inaug. Diss., Hanover.* pp. 46. 1 fig., 4 tables, 2 graphs. [Numerous refs.]

Nine cases of milk fever were treated with a solution containing 40 g. $CaCl_2$, 15 g. MgCl and 300 c.c. H_2O, as advocated by SJOLLEMA for grass tetany in cows, and three cases were treated with calcium borogluconate. J. found that both types of treatment brought about recovery, but that the borogluconate was the more useful owing to the speed with which it can be injected. Blood analyses were carried out in each case.—JAMES STEWART.

Reihart, O. F. (1937). **The Glucose Tolerance of the Cow. A Preliminary Report.**—*N. Amer. Vet.* **18.** No. 8. 25-29. 5 figs. [5 refs.]

Results of sugar estimations on blood and urine taken from one cow at frequent intervals after intravenous glucose injections, showed that the tolerance was very low, lying between 10 and 20 g., *i.e.* not exceeding 47 mg. glucose per kg. of body weight.—R. Allcroft.

Demianovitch. (1937). Traitement rationnel de la gale chez les animaux. [**Rational Treatment of Mange in Animals**].—*Bull. Off. internat. Epiz.* **14.** 318-328. Discussion pp. 468-469.

In 1922 D. first reported the treatment of scabies in man by the application of sodium hyposulphite and hydrochloric acid. He has applied the method with success since 1933 not only in the treatment of all kinds of mange in horses, but in other domestic animals including camels, sheep and rabbits. The curative action of these agents depends upon the liberation of sulphur and sulphur dioxide and, to some extent, upon the action of the intermediate products such as thiosulphuric acid.

The treatment is applied to the horse in the following manner :– the long hair is clipped off, the skin is washed with soap and water, 60% solution of sodium hyposulphite is applied with a brush using friction and the skin is allowed to dry for about 2 hours. 10% solution of crude hydrochloric acid is then applied in the same manner. When the horse is again dry the whole process is immediately repeated. The treatment is again carried out 2 or 3 days later. Advanced cases may need a third application, but if the disease is caught in the early stages the initial application is sufficient. The treatment is harmless to the patient ; it does not cause dermatitis, nor is there any fear of poisoning ; it is easy to apply and is effective ; it does not affect the general condition of the horse and it leaves the coat clean.—G. Williamson.

POISONS AND POISONING.

Roholm, K. (1937). **Fluorine Intoxication. A Clinical Hygienic Study with a Review of the Literature and some Experimental Investigations.** pp. xi + 364. 12 text figs., 84 figs. on 47 plates, 57 tables. [Numerous refs.] [Swedish summary]. London : H. K. Lewis & Co., Ltd. ; Copenhagen : Arnold Busch. [4to].

Fluorine occurs in nature in rocks and minerals such as apatite, cryolite, fluorspar and phosphorite, and traces are found in certain soils and waters. Small quantities are found in plant and animal tissues, especially in bone ash (0·01 to 0·1%) and tooth ash (0·01 to 0·04%). The present investigations began with a study of fluorine intoxication amongst cryolite workers in Copenhagen.

Acute poisoning is manifested by local irritations or corrosion and by symptoms due to absorption. Haemorrhagic vomiting, diffuse abdominal pains, weakness and diarrhoea accompanied by a lowering of blood Ca are among the usual symptoms. P.M. examination reveals a haemorrhagic gastro-enteritis, acute nephritis and varying parenchymatous degenerations of the viscera. The M.L.D. for the lower mammals is from 23-90 mg. F per kg. body weight ; man is more sensitive and 6-9 mg. F per kg. may cause death. 5-15 g. NaF is a toxic dose.

In chronic poisoning, F principally causes (1) degenerative tooth changes, (2) diffuse osteosclerosis, and (3) a generalized osteomalacia-like bone disease. Teeth already calcified are not affected by F ingestion, but calcifying teeth undergo

degenerative changes accompanied by localized areas of pigmentation (" mottling"). In osteosclerosis the cancellous bones are principally affected, these bones becoming denser, heavier and more brittle than normal bone. There is excessive calcium deposition and increased formation of dentine and cement in the teeth. Chronic fluorine poisoning results in most mammals (not man) in an osteomalacia, accompanied by anorexia, emaciation and anaemia [*V. B.* **4.** 779]. Exostoses appear in the mandibles, and in the bones of the extremities. Nephritis is also a common concomitant. 15 to 20 mg. F per kg. body weight is a daily dose sufficient to cause the condition in growing rats, pigs and dogs, and death occurs in the course of weeks or months. Herbivora appear to be more sensitive and the intoxication is expedited during periods of increased Ca requirement (growth, reproduction and lactation). F is absorbed from the alimentary tract and gaseous F compounds may be absorbed from the lungs. Storage occurs mainly in the teeth and bones, and this is most marked under conditions of chronic intoxication. F does not appear to permeate the placenta, but is excreted in the milk of women and of the rat. A negative Ca balance is found after large doses of F. The effect on osseous and dental tissue appears as (a) the formation of an abnormally structured organic matrix, and (b) an irregular calcification.

The known chronic intoxications include (a) mottled teeth, a dental disease common to man in various parts of the world, (b) osteosclerosis, an occupational disease among cryolite workers in Copenhagen, (c) osteomalacia, endemic among herbivora in the vicinity of certain manufacturing plants in Europe, (d) darmous [*V. B.* **2.** 509.], a dental and mandibular disease among herbivora in various parts of N. Africa, and (e) gaddur, a dental and osseous disease appearing among herbivora in Iceland following volcanic eruptions [*V. B.* **4.** 779].

Possibilities of chronic intoxication occur from drinking water and plants growing in regions where the soil is rich in F, from volcanic products and products of factories, from the use of F compounds for food preservation and for insecticides, and in therapeutics. R. recommends more stringent legislation in the sale, handling and use of F-containing compounds.

A very complete bibliography of nearly 900 references is included.—A. Eden.

Cutler, J. T. (1934). **Studies in Experimental Trembles or Milk-Sickness.**—*J. Tenn. Acad. Sci.* **9.** 1-7. [9 refs.] [Copied *verbatim* from *Exp. Sta. Rec.* **73.** 843].

The author's studies have led to the conclusion that (1) an accumulation of guanidine is a complicating factor in acute white snakeroot or richweed poisoning (*Eupatorium urticaefolium*) known as human trembles, (2) this accumulation must contribute materially to the production of the severe symptoms of the intoxication and be responsible, in a large measure, for the low blood sugars found in this condition, and (3) calcium medication should prove a valuable supplement for the treatment of trembles (and probably also milk sickness) by alleviating the symptoms which are caused or aggravated by guanidine.

Couch, J. F. (1937). **The Chemistry of Stock-Poisoning Plants.**—*J. chem. Educ.* **14.** 16-30. 27 figs., 3 tables. [Numerous refs.]

The more important poisonous plants (with particular reference to those that cause notable losses of livestock in the United States of America, are classified and discussed according to the chemical groups in which their active principles occur. By this method the plants are divided into the following categories :– those in which the active poisonous principle is an alkaloid, a glucoside, including the cyanogenetic and saponinic, a phytotoxin, a resinoid, oxalic acid, or a phenol,

with a miscellaneous group in which are placed those plants whose active principles are unique.—R. Allcroft.

Candioti, A. M. (1936). El doping. Sus consecuencias y represión. [**The Doping of Racehorses**].—*Rev. Med. vet., B. Aires.* **18.** 275-304.

This article seeks to show that clinical examination of racehorses both before and up to 24 hours after racing is more trustworthy than the method of collecting saliva as at present practised in Great Britain. The " doped " racehorse is said to show an unmistakeable clinical picture; it moves restlessly in the paddock, stepping as though in fear, with the ears rigidly fixed forward and pupils dilated, sometimes breaking into patchy sweat. Expiration is convulsive, pulse accelerated and strong. A fine tremor is palpable in all the cutaneous muscles.

The present method of collecting saliva in the Argentine is said to be unreliable, as the fermentation of normal vegetable substances in the mouth interferes with the test. Moreover, the presence of alkaloids in the saliva may be delayed, with the result that they may only appear after the sample has been taken. Blood and urine tests should also be made.—J. Pasfield.

Vuillaume, R., & Tichit. (1936). Empoisonnement des bovins par les explosifs. [**Poisoning of Cattle by Drugs with Explosive Properties**].—*Bull. Soc. Sci. vét. Lyon.* **39.** 16-22. [2 refs.]

After considering the chemical and physical properties of explosives, the chief of which are nitrated organic compounds, the authors report an instance of poisoning. Two cows obtained access to cartridges composed of sodium chlorate, dinitrotoluene and castor oil, consuming about 150 g. One cow died an hour afterwards in great distress and the second soon after from asphyxia, preceded by distress and nystagmus. In each case the blood was black and incoagulable. No P.M. examination was made. Analogous symptoms are shown in experimental poisoning of dogs by sodium chlorate, accompanied by asphyxia and similar blood changes. The action of dinitrotoluene is apparently on the heart. Although toxic doses of these explosives are not known, they must be considered dangerous to animals since ingestion is followed by grave consequences.—Alfred Eden.

PHYSIOLOGY.

Sankaranarayanan, N. S. (1937). **Haematological Studies in Indian Dairy Animals.**—*Indian J. vet. Sci.* **7.** 97-107. 6 tables, 1 chart. [4 refs.]

Ninety-seven cattle of various Indian breeds were examined haematologically. An Ayrshire bull and twelve Murrah buffaloes were also included in this study. Erythrocyte, leucocyte, and differential leucocyte counts were performed, but haemoglobin values were not estimated. Notes on the technique and adequate tables of the findings are given.

Erythrocyte and leucocyte counts were found to be higher in the Indian cattle than in European cattle, and the buffaloes had higher counts than the cattle, the red cells reaching 11 million per c.mm., and the leucocytes 20,000. The values in cross-bred cattle agreed with those in European cattle. Differential leucocyte counts revealed no striking difference from those in European cattle as given by Fraser (1931) [*V. B.* **1.** 306]. [It is to be regretted that this useful work on normal standards is complicated by the use of four distinct breeds and numerous cross-bred animals in the 97 cattle studied. The use of one Indian breed alone would have been of more statistical significance].—D. L. Hughes.

I. Herling, H. (1936). Die Senkungsgeschwindigkeit der Blutkörperchen bei jungen Schweinen in den ersten Lebenswochen. Zugleich ein Beitrag über den gegenwärtigen Stand der Erkenntnis dieses Problems in der Human- und Veterinärmedizin. [**Red Blood Cell Sedimentation in Piglets**]. —*Inaug. Diss., Hanover.* pp. 74. 6 tables, 4 graphs. [Numerous refs.]

II. Morhart, H. (1937). Eine neue Methode zur Bestimmung der Blutkörperchensenkungsgeschwindigkeit (S.G.) langsam senkender Blutarten. [**A New Slow Method for Blood Cell Sedimentation**].—*Münch. tierärztl. Wschr.* **88.** 205-207. 3 figs. [8 refs.]

I. The red blood cell sedimentation rate of the blood of young pigs was observed by the Kaunitz micro method. The results are shown graphically. Sedimentation is complete in 24-36 hours : the results were not influenced by the age or sex of the animals, and succeeding tests on the same animal never gave identical results.

II. Blood was collected in amounts of 10 c.c. from a vein into a graduated tube containing 1 c.c. of 5% sodium citrate. The sedimentation rate of bovine blood was investigated by centrifuging it at 1,250 r.p.m. in a U-shaped tube for periods of three minutes, the height of the R.B.C. being observed ; 16 observations were made. After the last of these the centrifuge rate was increased to 3,000 r.p.m. and three more observations were made after 5, 10 and 20 minutes.

—G. Hartmann (Vienna).

Olson, C. (1937). **Variations in the Cells and Hemoglobin Content in the Blood of the Normal Domestic Chicken.**—*Cornell Vet.* **27.** 235-263. 5 figs., 7 tables. [Numerous refs.]

This study consisted of total counts of the erythrocytes, leucocytes, and thrombocytes ; of haemoglobin estimations ; and of relative counts of the different kinds of leucocytes. It is so involved that it is impossible to abstract its contents in a few lines ; the interested reader should consult the original.

[The data are said to have been analysed statistically, but in fact only simple methods such as the calculation of means and standard errors have been used. Apparently no precise methods, involving the use of partial correlation co-efficients or the correlation ratio, were used to exclude the effects of age, sex, season etc., although these effects are referred to. Moreover the actual data are not published so that it is impossible for anyone interested to check or extend Olson's findings ; he would be well advised to publish full data in future].

It would seem that in adult fowls the erythrocytes number about 3 million per c.mm., thrombocytes about 26,000 and leucocytes about 20,000 per c.mm. ; that the haemoglobin content is about 10·12 g. per 100 c.c. ; and that the relative percentages of leucocytes are as follows :–lymphocytes 62·5, heterophiles (polynuclears) 24·4, eosinophiles 1·9, basophiles 1·7 and monocytes 9·4.

—F. W. Priestley.

Apinis, P. (1936). Untersuchungen über Blutfäden. [**Blood " Filaments " in Animal Blood**].—*Wien. tierärztl. Mschr.* **23.** 680-681.

A. examined fresh cover glass preparations of blood from a number of domestic animals and describes the characters of the wavy filamentous structures which appear and which, he considers, develop from the breakdown of the red cells. The formation of the filaments is accelerated by the addition of sodium chloride to the blood and by keeping the blood at 27°-30°C. They appear more rapidly in the blood of cachectic animals ; apart from this, they are not related to disease.

—E. G. White.

Bruner, H. D., & Wakerlin, G. E. (1937). **The Blood Picture of the Normal Dog.**—*Proc. Soc. exp. Biol., N.Y.* **36.** 667-670. 1 fig., 1 table. [7 refs.]

Seventeen male and 17 female dogs varying in weight from 13 lb. to 60 lb. fed on a commercial dog food supplemented by bones, were used in this study, a total of 251 weekly estimations being performed. Values for the following blood elements were obtained, red cell, leucocyte and reticulocyte counts, haemoglobin and the packed cell volume. Mean corpuscular volume, mean corpuscular haemoglobin and mean corpuscular haemoglobin concentration were also calculated. The technique employed is described. The results are recorded in histograms, and they are also statistically analysed.

Variations of as much as one million in the red cells counts of individual dogs in a few days were not uncommon. These variations were accompanied by more or less corresponding changes in the haemoglobin and packed cell volume. As has been previously recorded, wide variations in the leucocyte counts were observed. No significant differences were noted in the sexes.—D. L. Hughes.

Steinhart, P. (1937). Der Schlaf des Pferdes. Seine Dauer, Tiefe, Bedingungen. [**Sleep of Horses**].—*Z. Veterinärk.* **49.** 145-157 and 193-232. 2 figs., numerous tables. [Numerous refs.]

All the phenomena of sleep may be referred to a reduction in the irritability of the central nervous system. The desire for sleep is brought on by fatigue as a result of the accumulation of waste products in the tissues, etc., by a reduction in the strength of external stimuli reaching the body, and by psychic factors.

Animals may be divided broadly into those which have one long period of sleep during the 24 hours, *e.g.*, birds, and those which have several short periods, *e.g.*, cats and dogs. Continuous observation of horses for 24 hours shows that they belong to the second group and may, during this period, sleep from three to sixteen times, the average being nine. The length of sleep varies between a few minutes and several hours, the longer periods being between 1 a.m. and 5 a.m. Horses sleep standing and only lie down for short periods at a time. The depth of sleep as judged by the reaction to light, to noise, to stimulation of the skin or of the sense of smell varies considerably, so that sleep may be classified as half sleep, light, medium or deep sleep. Deep sleep, in which there is complete abolition of reflexes and often in addition Cheyne-Stokes respiration, is only seen in horses when they are lying down. They are always easily awakened by noise.

It is concluded that for the proper rest of horses not only is the duration of sleep important, but also the time spent in lying down. The latter can be prolonged by providing a warm, dark roomy box with good straw bedding.—J. A. Nicholson.

Mongiardino, T. (1937). Osservazioni sulle terminazioni nervose nella membrana cheratogena dell'Equus caballus. [**Nerve Endings in the Hoof Matrix of Horses**].—*Profilassi.* **10.** 46-53. 9 figs. [English, French and German summaries].

The material used for these studies was obtained from the anterior part of the hoof of foals which had never been shod. After slaughter, the horny walls were cut away as far as possible without injuring the sensitive structures beneath, portions of which were then used. The sections were stained by Cajal, Bielschowsky and Ruffini's methods. Numerous Pacinian corpuscles were seen in the laminae, collected into groups and situated between the vascular and nervous layers at the base of the papillae. Judging from the distribution and position of the corpuscles, it seems probable that they give rise to kinaesthetic sensations telling the animal the nature of the ground and the force with which the foot is

meeting it. No intra-epithelial nerve endings were found and no corpuscles were present in the plantar cushion or in the coronary or solar matrix.—J. A. Nicholson.

Winters, L. M., & Feuffel, G. (1936). **Studies on the Physiology of Reproduction in the Sheep. IV. Fetal Development.**—*Tech. Bull. Minn. agric. Exp. Sta.* No. 118. pp. 20. 12 figs., 5 tables. [19 refs.] [See also *V. B.* **5.** 764].

Mature Shropshire ewes at various stages of pregnancy were slaughtered so that the normal foetal development could be studied. 73 foetuses were examined at 15 different development stages. In addition to weight and volume a large number of different dimensions were measured, the most useful being forehead-rump length, chest circumference, and abdominal circumference. The development appeared to be most marked during the early stages and was exceedingly rapid between the ages of 34 and 58 days. Neither the size of the ewes nor their diet appeared to have much effect on the rate of development.

A summary is given in tabular form of the averages of the measurements at various stages in the hope that it will prove useful as a standard of normal development.—A. Robertson.

Peli, I. (1937). Contributo allo studio dei gemelli intersessuali della specie bovina. [**Research on Bovine Twins of Opposite Sex**].—*Nuova Vet.* **15.** 227-232. 5 figs., 1 table.

Twins of the same sex in cattle develop normally and are fertile, but in 94% to 98% of cases where they are of opposite sex (freemartins) the male is normal and fertile while the female is sterile. Foetal membranes of cattle may be monochorionic or dichorionic. In the first case there is a single chorion containing the two foetuses each of which is enclosed by a single amnion, or occasionally there is only one amnion enclosing both. In the second case, the foetuses are enclosed in two distinct chorionic sacs which may be clearly separated from each other; they are either partially joined but with separate vascular systems, or joined and possess a common vascular system which allows the blood of the foetuses to mix. Monochorionic twins are identical, whereas dichorionic twins need not resemble each other, and histological examinations have shown that a freemartin results only when the dichorionic vascular systems are anastamosed.

—J. A. Nicholson.

Anderson, J. (1936). **Studies on Reproduction in Cattle. Pt. I. The Periodicity and Duration of Oestrus. Pt. II. The Influence of Environmental Factors on Reproduction.**—*Emp. J. exp. Agric.* **4.** 186-195 and 197-207. 5 figs., 9 tables. [Numerous refs.]

Observations were undertaken to ascertain if variations in the duration of oestrus occurred from season to season in zebu cattle in Kenya, and to investigate the relationship of any such variation to seasonal changes in environmental conditions. Daily records of rainfall and temperature, and observations on the amount of cloud were made, and analyses of pastures were undertaken monthly. Particulars of these are given. Records of observations of the phases of the oestral cycle are also submitted. The mean duration of the cycle was 20·1 days and of oestrus itself 1 hour, 20 minutes, but it should be noted that the experiment was confined to a period of 12 months and that only 5 cattle were observed.

No relationship between either rainfall, temperature or seasonal variation in pasture constituents, and the periodicity and duration of oestrus was noted, but, as regards the known stimulating effect of light on reproductive function in certain species, it is significant that oestrus was found to be long in those months when there was most sunshine.

A summary of the more recent investigations into the relationship of rainfall, temperature, light, nutrition and reproduction is given.—H. V. Hughes.

Warbritton, V., & McKenzie, F. F. (1937). **The Pituitary Glands of Ewes in Various Phases of Reproduction.**—*Res. Bull. Mo. agric. Exp. Sta.* No. 257. pp. 59. 28 figs., 5 tables. [Numerous refs.]

Pituitary glands from 60 ewes slaughtered at different phases of reproduction were studied by numerous histological methods. The gland was found to resemble that of other species in general structure, but to have a more complex cell pattern, which is fully described.—A. Robertson.

Gomez, E. T., & Turner, C. W. (1937). **Hypophysectomy and Replacement Therapy in Relation to the Growth and Secretory Activity of the Mammary Gland.**—*Res. Bull. Mo. agric. Exp. Sta.* No. 259. pp. 72. 17 figs., 1 table. [Numerous refs.]

A study of the effect of pituitary and ovarian hormones on the mammary glands of g. pigs, rats, mice, rabbits and cats. The injection of various ovarian hormones was ineffective in stimulating the growth of the mammary glands of completely hypophysectomized animals while producing complete hyperplasia of the glands in normal or castrated animals. The injection of purified thyrotropic, adrenotropic, and lactogenic hormones and desiccated whole sheep pituitaries alone or in combination with ovarian hormones, failed to stimulate the growth of the duct system of the mammary glands in completely hypophysectomized animals. The daily implant for 20-25 days, of pituitaries obtained from rats which had previously been injected daily for 10 days with ovarian hormones, had an effect on hypophysectomized animals similar to that of ovarian hormones on normal animals, *viz* growth of ducts followed by proliferation of the lobule-alveolar system.

Hypophysectomy at any time during lactation was immediately followed by rapid cessation of milk secretion. By the injection of crude pituitary extracts this cessation could be prevented, or milk secretion re-established if it had ceased. Similarly the simultaneous injection of galactin, glucose solution and the adrenotropic hormone or extract of the adrenal cortex was also capable of supporting the continuation of lactation or of initiating it after it had ceased. The lack of any one of the above factors immediately held the secretory activity in abeyance. —A. Robertson.

Wagner-Jauregg, T. (1936). Die biologische Bedeutung der Flavine. [**Biological Significance of the Flavines**].—*Wien. klin. Wschr.* **49.** 257-262. [Num. refs.]

Lactoflavine is a part of the vitamin B complex. There is complete cessation of growth in rats on a lactoflavine-free diet. It is not the rat antipellagra factor (usually called vitamin B_2), but whether or not lactoflavine is associated with human pellagra is not clear. Lactoflavine is present in milk, muscle, liver, heart, kidney and in many plants. It has been isolated in pure crystalline form and has been synthesized. It forms a reversible oxidation-reduction system, being reduced by various substances in the presence of tissue enzymes, and spontaneously reoxidized. Only in milk, urine and the retina does it occur unbound. Elsewhere it is attached to the protein molecule or " carrier " and, as such, forms Warburg's yellow oxidation ferment which plays an integral part in cell oxidations.—J. M. Robson.

Olsson, N. (1936). Untersuchungen über die Möglichkeit Vitamin D-Präparate mit wachsenden Küken zu standardisieren. [**Attempts to Standardize**

Vitamin D Preparations by Tests on Growing Chickens].—*Arch. Geflügelk.* **10.** 423-436. 7 figs., 3 tables. [7 refs.] [English summary].

The distance between the calcification zones of the distal bone in the tarsus and in the metatarsus (tmt) is inversely proportional to the intensity of calcification in growing chicks. Vitamin D can be standardized with chicks (optimum age = 6 weeks) by using tmt values as indication of the calcification, provided that the vitamin D intake is sufficiently small to affect a variation in these values, and a sufficient number of chicks are used.—J. M. Robson.

Lesbouyries, Berthelon, & Bagé. (1937). Action de la vitamine E sur l'appareil génital de quelques femelles domestiques. [**Action of Vitamin E on the Genital System of Female Domestic Animals**].—*Bull. acad. vét. Fr.* **10.** 191-194.

Investigating a claim that injection of vitamin E could produce signs of oestrus in immature females, the authors gave large doses of the active fraction of wheat germ oil (both subcut. and intramusc.) to six ovariectomized rats, two immature bitches, one immature sow, and two ewes which were at the period of anoestrus. No signs of oestrus appeared in any of the animals.—A. Robertson.

Calisti, V. (1937). Correlazioni tra le dimensioni del metacarpo e il Ca del sangue. Contributo allo studio delle correlazioni endo-interne ed endo-funzionali. [**Relation between Size of the Metacarpus and the Blood Calcium**]. —*Nuova Vet.* **15.** 271-276. 8 tables, 1 chart.

From measurements of the metacarpal bones of 111 lambs about one month old, C. was able to obtain mathematical correlation coefficients between the length, the external and the internal diameter of the bones. Blood calcium determinations were also made, but no correlation coefficient between the amount of calcium in the blood and the proportions or size of the metacarpal bones could be found. —J. A. Nicholson.

TECHNIQUE.

de Cisneros, J. M. G. J. (1936). El cultivo de los dermatomycetos sobre medios natura es vegetales y animales. [**The Cultivation of the Dermatomycetes on Natural, Vegetable and Animal Media**].—*Med. Países calidos.* **9.** 1-15 and 49-74. 10 figs. [Copied *verbatim* from *Rev. appl. Mycol.* **16.** 383].

Wheat or oat grains, and wheat flour, starch, and dextrin agar constituted less suitable media for 15 strains of dermatophytes used in the author's studies than the standard nutrient substrata [(1936). *Arch. Derm., Chicago.* **23.** 665 and **64.** 79]. Twenty species of Epidermophyton, Microsporon, Achorion, and Trichophyton, however, made excellent growth on human and animal (sheep) cerebral pulp, which retarded pleomorphism in the initial stages but was powerless to restore the original characters in cases where this process had reached an advanced phase.

Kauffmann, F. (1937). Ueber das kombinierte Anreicherungsverfahren für pathogene Darmbaktieren. [**The Combined Enrichment Method for Intestinal Bacteria**].—*Z. Hyg. InfektKr.* **119.** 233-237. 1 table. [8 refs.]

This is a further contribution from K. [*V. B.* **6.** 854.] on different methods of isolation of salmonella and describes the examination of 1,168 samples of faeces of which 108 yielded salmonella. Direct examination on Drigalski's medium yielded 43 only, and on a tetrathionate medium of Schäfer there were 78

positive cultures. The combined enrichment medium of K. including tetrathionate, brilliant green and bile was also used and yielded 93 positive cultures.—R. Lovell.

Graham, W. R., Jr., Turner, C. W., & Gomez, E. T. (1937). **A Method for Obtaining Arterial Blood from the Goat.**—*Res. Bull. Mo. agric. Exp. Sta.* No. 260. pp. 15. 11 figs. [17 refs.]

A description is given of the operative technique employed in bringing the carotid artery of the goat to the surface of the skin for use in the convenient and frequent sampling of blood. The advantages of comparisons of carotid arterial and mammary venous blood as related to milk secretion are discussed.

—R. Allcroft.

Plum, P. (1936). **Accuracy of Haematological Counting Methods.**—*Acta med. scand.* **90.** 342-364. 12 figs., 4 tables. [Numerous refs.] [In English]. [Copied *verbatim* from *Trop. Dis. Bull.* **34.** 254. Signed H. H. S.]

This article is of fundamental importance and does not admit of abstract. Haematologists should consult the original. The author begins with an historical sketch of the development of blood-counting methods during the past hundred years and discusses their accuracy or want of it, the errors being due either to unequal distribution of the corpuscles in the counting chamber or smear, or to faulty measuring of the blood and diluent. He shows by experiment that the former of these plays the chief part in errors of individual counts, whereas the latter plays a relatively small part. The mean error in counting-chamber counts is equal to the square root of the number of cells counted; the mean error in differential count on a smear regarded as properly made may be calculated by Bernouilli's theorem $m = \sqrt{n.p.q}$. He gives a diagram of the calculated mean error in different counts of 100 to 1,000 leucocytes.

MISCELLANEOUS.

Anon. (1936-1937). **American Public Health Association Year Book.** pp. v + 204. 7 figs., 12 tables, 1 graph. [Numerous refs.] New York: American Public Health Association. [4to] [Suppl. to *Amer. J. publ. Hlth.* **27**].

This is a supplement to the *American Journal of Public Health* and gives details of the American Public Health Association and its numerous committees, which present reports annually in this year-book.

In the report of the laboratory section of the association, R. V. Stone gives a short article on aspects of veterinary public health, R. S. Breed discusses the examination of dairy and food products and J. M. Coffey describes a method for identifying haemolytic streptococci. The public health engineering committee reports on the hot air sterilization of milk utensils.—J. E.

Lührs, E. (1937). Der Geflügelgesundheitsdienst des Reichsnährstandes. [**The Poultry Health Service of the Reichsnährstand**].—*Z. Fleisch- u. Milchhyg.* **47.** 177-180.

According to regulations dated the 29th August, 1936, the Poultry Health Service of the German Reichsnährstand undertakes to render assistance to subscribing poultry owners in improving and maintaining the health of the poultry. It is hoped by this means to render German poultry-keeping economic. The Poultry Health Service will carry out all necessary inspections and P.M. examinations (bacteriological, histological, etc.), and in return each owner must contribute a

small annual sum per head of poultry. In the case of epidemics, the Director of the Poultry Health Service is empowered to impose a special charge. Veterinary surgeons and other responsible officers of the service must have free access to the farms of subscribers.—M. BURKE.

ANON. (1937). Hodowla zwierzat futerkowych w Niemczech i w Polsce z punktu widzenia lekarsko-weterynaryjnego. [**Fur Animal Breeding in Germany and Poland from the Veterinary Standpoint**].—*Zycie weteryn.* **12.** 7-14. [1 ref.]

A general article on the fur animal industry in Germany and Poland and its importance from the veterinary aspect.—A. SZWABOWICZ (Lwów).

SERRES, J. R. (1936). El consejo consultivo de epizootias y la ley de policia sanitaria. [**An Animal Diseases Council and the State Control of Animal Diseases in the Argentine**].—*Rev. Med. vet., B. Aires.* **18.** 570-587.

S. emphasizes the importance of the foundation of an animal diseases council for the purpose of advising the government on methods of controlling animal diseases in the Argentine. It is important for the country to put under control certain important diseases which are liable to be introduced by imported animals – such as bovine brucellosis and paralytic rabies.—S. TORRES.

ANON. (1936). Memorial presentado por la Sociedad de Medicina Veterinaria. A S.E. el Señor Ministro de Agricultura propeniendo medidas para impulsar el fomento y la sanidad de los ganados de nuestro pais. [**Memorandum on Veterinary Affairs Presented by the Argentine Veterinary Medical Association to the Minister of Agriculture**].—*Rev. Med. vet., B. Aires.* **18.** 179-186.

The recommendations of the Argentine Veterinary Medical Association are :– the appointment of a technical committee of 5 or 6 members to co-ordinate all branches of animal industry and to produce standards for comparison with those of other countries ; the decentralizing of the Department of Animal Husbandry ; greater powers for the Ministry of Animal Health to isolate infected areas in the case of certain diseases ; instruction for farmers by lectures and pamphlets ; co-operation with the medical profession where necessary in controlling transmissible diseases, and in certain cases installation of field laboratories nearer the scene of outbreaks.

Emphasis is laid on the necessity for stricter control of ectoparasitic affections, especially sheep scab, since the sheep population of Argentina is 44 millions. It is urged that the routine veterinary inspection of dairy herds is of national importance.—J. A. PASFIELD.

VIRVIESCAS, F. (1936). Informe rendido al Ministerio de Agricultura y Comercio, por la comisión que fue a la región de Casanare. [**Report to the Minister of Agriculture on Animal Husbandry and Disease in Colombia**].—*Rev. Med. vet., Bogotá.* **7.** 143-149.

A report by a committee which studied animal husbandry in the Casanare district of Colombia. The savannas are of poor quality and liable to drought during February and March, at which season the livestock congregate by the rivers and ponds, thereby favouring the spread of disease. Proposals are made for irrigation schemes and for the planting of fodder crops. Lists of prevailing animal diseases are given. They include trypanosomiasis, piroplasmosis and several parasitic diseases of cattle, and strangles, trypanosomiasis, piroplasmosis and cerebrospinal meningitis in horses.—S. TORRES.

OFFICIAL AND OTHER REPORTS

GREAT BRITAIN. ANON. (1937). **Reports on the Work of Agricultural Research Institutes and on Certain Other Agricultural Investigations in the United Kingdom, 1934-1935.** pp. v + 338. 1 appendix. [Numerous refs.] London: H.M. Stat. Off. [8vo] [5s.]

The report is in three sections :– (1) research institutes; (2) special work done at advisory centres, and (3) other investigations at various centres. In each case there is a summary of the work done and a list of papers published. A comprehensive guide to all veterinary research carried out in Great Britain during the period is provided by this volume.—J. E.

GOLD COAST COLONY. (1937). **Report on the Department of Animal Health for the Year 1936-37.** [J. L. STEWART]. pp. 35. 1 table, 1 map, 1 appendix. Accra: Govt. Printer. [fcp] [2s.]

ANIMAL DISEASES.—So susceptible are the unhumped West African Shorthorn cattle to RINDERPEST that it has been found impossible to maintain a reserve of 20,000 unimmunized cattle and these cattle have been immunized permanently, the susceptible cattle required for laboratory purposes being now purchased from the young cattle which come to the district camps to be treated. The present rinderpest situation is that all the adult cattle of the country have been permanently immunized by the sero-virus method following a preliminary small dose of vaccine and that the young two-year-olds are treated annually at district camps. It is stressed that this is satisfactory but is actually a palliative, as the cessation of anti-rinderpest immunization for a few years would result in a susceptible cattle population once more.

A conference was held at Pong-Tamale between the veterinarians of the Gold Coast, Nigeria and several French West African colonies and the most emphatic resolution was that rinderpest could be totally eliminated from West Africa by international action.

CONTAGIOUS BOVINE PLEURO-PNEUMONIA occurred frequently, but the efficacy of the laboratory vaccine is so satisfactory that all these outbreaks were suppressed easily by the slaughter of the infected herds plus vaccination of the surrounding cattle.

The serious RABIES outbreak may be considered over as it is some time since a definite case was reported. This covered a period of two years and gave considerable anxiety, but was useful in that it has enabled the laboratory to produce an efficient vaccine.

VETERINARY LABORATORY.—Anti-rinderpest products, cont. bov. pleuro-pneumonia and antirabies vaccines and tsetse research and eradication continue to be the main activities of this institution but other research was also accomplished.

ANIMAL HUSBANDRY.—Great advance has been made during the year and the bull situation is now much better. Pong-Tamale main farm is now producing a hundred bulls per annum, native administration farms are beginning to issue bulls, new native administration farms are being organized and native administrations have purchased good young bulls at immunization camps for eventual issue to the village herds. The water situation in the Northern Territories is now being tackled seriously by the government and the livestock industry prospects are most encouraging especially as there is always an unsatiable market in the cocoa areas of the Gold Coast.

The greater part of the activities of the department is in the Northern Territories, whose organization has been recently changed by the institution of native

administration or indirect rule in place of direct rule by the political administration. The change affects the department in that its functions, especially in animal husbandry, are more advisory than directive. The change has been excellent as the natives now show much more interest in the work of government because it is applied through themselves in the shape of their own native institutions. Constructive criticism is now quite frequent in place of the acquiescent agreement of the apathetic.

U.S.A., MONTANA. (1936). **Report of the Livestock Sanitary Board, December 1st, 1934 to November 30th, 1936.** [BUTLER, W. J.] pp. 38. [8vo] [Mimeographed].

EQUINE ENCEPHALOMYELITIS was first noted in Montana in 1935, 135 cases being seen. In 1936, two outbreaks occurred within 50 days of each other. In the first outbreak 4,637 horses were exposed to infection; 5,712 were vaccinated and 322 cases occurred. In the second, 91 cases occurred among the 1,770 exposed. EQUINE INFECTIOUS ANAEMIA (SWAMP FEVER) became more prevalent during the period. Montana remains a modified accredited TUBERCULOSIS-free area. In 1935, some 77,000 cattle were tested for BOVINE BRUCELLOSIS and 8,165 reacted positively (0·106%); in 1936, 9,069 of 137,000 cattle reacted (0·066%). COCCIDIOSIS caused some trouble in cattle and sheep. SWINE FEVER was not prevalent. Many other diseases are referred to by name or in a few lines and considerable information is given in tables and in special reports on the diagnostic work done.
—J. E.

BOOK REVIEWS.

EHRLICH, C. [Dr. Abteilungsvorsteher beim Tiergesundheitsamt der Landesbauernschaft Hannover]. (1937). Die Aufzuchtkrankheiten der Jungtiere. Band 15. [**Diseases of New Born and Young Animals. Vol. 15**]. pp. 132. 51 figs. Berlin: Reichsnährstand Verlags-Ges. m.b. H. [8vo] [RM.3].

This is one of a series of booklets issued by the Reichsnährstand for the instruction of farmers, not only from the technical viewpoint, but also with due regard to farming as a part of national activity under National Socialist concepts. The first part of the book deals with the causation of losses, and outlines methods for preventing them by correct housing and management. The second part deals with the diseases of new-born and young foals, calves, piglets, lambs, kids, and of young pigeons, geese and ducks.—J. E.

SCHMID, F. [Dozent, Dr. med. vet. habil., Leiter des Instituts für Parasitologie und veterinärmedizinische Zoologie der Tierärztlichen Hochschule Hannover]. (1937). Diagnose und Bekämpfung der parasitären Krankheiten unserer Haustiere. [**The Diagnosis and Control of Helminth Parasites of Domestic Animals**]. pp. vii + 134. 65 figs., 1 plate. [Numerous refs.] Berlin: Richard Schoetz. [8vo] [RM.7.40].

This is a book of the compendium class, in which S. has set out to give the essentials of veterinary parasitology as applied to Central Europe in the shortest practicable space, no attempt at completeness being made.

There are general descriptive chapters on the biology of parasitic protozoa, worms and arthropods, on diagnosis, control measures and on immunity, followed by a systematic description of the common parasites of horses, ruminants, swine, carnivora and poultry. At the end there is a note on the methods to be used in the examination of samples for diagnosis, an illustrated table designed to assist in microscopic diagnosis, a host list of parasites, and a list of text-books.

The author seems to have made a good choice of what to include and what to omit and the book should be of value to a practitioner. Curative treatment is described. The figures are all very clear and contribute much to the value of the book. Veterinary students learning German will find it specially valuable, as common German names are freely used alongside the Linnean names. Thus, for instance, the reader can learn that a "Quesenbandwurm" is the worm causing "gid = Drehkrankheit" in sheep (*Taenia coenurus* infestation): ordinary dictionaries usually do not give special information like this.—J. E.

HYDE, R. R. [Professor of Immunology and Director of the Laboratories of Immunology and Filterable Viruses, School of Hygiene and Public Health, the Johns Hopkins University], & GARDNER, R. E. [Associate in Immunology]. (1937). **Laboratory Outline in Filterable Viruses.** pp. x + 85. 2 figs., 1 table, 1 photograph. [Numerous refs.] London, Bombay, Calcutta, Melbourne, New York, Boston, Chicago, Dallas, Atlanta, San Francisco, Toronto: Macmillan & Co. Ltd. [8vo] [7s. 6d.]

This is a laboratory text-book for students who desire to make a specialized study of virus diseases.

Part I is devoted to the nature and behaviour of certain filtrable viruses. The technique of filtration is described and the method of preparation and use of ultrafilters. Bacteriophage and its associated phenomena are considered from the practical aspect in some detail. Methods of virus cultivation are described.

Part II refers to the histopathology of certain virus diseases including fowl pox, variola and herpes. In both parts, exercises are set at the end of each section so that the student may draw his own conclusions from the practical results obtained from their performance.

A summary of staining and fixation methods is given, and a large number of references to virus diseases is a valuable addition.—E. C. HULSE.

LOEWENSTEIN, E. (1936). Die Tuberkelbazillämie in ihrer Auswirkung auf die Gesamtmedizin. [**Tuberculous Bacillaemia**]. pp. vi + 388. 10 figs. on 4 plates, numerous tables. [Numerous refs.] Leipzig & Vienna: Franz Deuticke. [4to] [M. 20].

The opening chapters of this book deal with the modifications of methods and media for the isolation of tubercle bacilli, some of which have proved of considerable value and are now adopted widely. The remainder of the book is occupied by data, collected over a period of 35 years, which, according to the claims of L., indicate that tuberculous bacillaemia is extremely common in many of the recognized forms of TB., and that tubercle bacilli may be cultivated from the blood in a large number of human conditions hitherto ascribed to other agencies, *e.g.*, chorea, rheumatoid conditions, multiple sclerosis, dementia praecox and skin conditions unassociated with lesions of a character recognized as obviously tuberculous.

[Unfortunately, it is impossible, on the evidence brought forward, to accept Löwenstein's conclusions, and workers interested in this subject should also refer to "Tuberculous Bacillaemia" by G. S. WILSON and his collaborators [*V. B.* **4.** 412.] in which it is concluded that tuberculous bacillaemia is of far less frequent occurrence than is claimed by L. and certain other workers; the excessive numbers of positive results being ascribed to failure to pay adequate attention to the numerous fallacies which may attend attempts to demonstrate *Mycobact. tuberculosis*, especially the frequent presence of saprophytic acid-fast bacilli in, for example, tap water, dust, sebaceous material, etc., which may be assumed to have come from the original material and be *M. tuberculosis*, unless adequate precautions are taken and the organisms fully identified].—A. W. STABLEFORTH.